JOURNAL OF GAS LIGHTING & WATER SUPPLY.

EDITOR & PUBLISHER: WALTER KING. OFFICE: 11, BOLT COURT, FLEET ST., LONDON.

VOL. CXXVIII., No. 2690.] TUESDAY, DECEMBER 1, 1914. [66TH YEAR.

EDITORIAL NOTES.

Lean Promise for Next Session.

THE portents supplied by the Parliamentary Notices are that the anticipations of a lean session in regard to Private Bill legislation are going to be realized to the full. There are, all told, only seventeen promotions dealing wholly or partly with gas; and not one of these can be singled out as bearing distinction. Of the seventeen Bills, nine are to be lodged by companies, and eight by local authorities. There is much of a likeness in the majority of the company Bills, and for the matter of that certain of the local authority measures could be bundled in with the company ones on the ground of similarity of characteristics. We see intimations of extension of limits of supply, of new capital powers, consolidation of capital, and authorization of quite ordinary kind which makes page after page of one Bill look very much like the pages of another Bill.

With few exceptions, the promoters are going to ask for the calorific standard, and the extinction of the illuminating power one. No less than seven companies out of the nine are definitely providing for the change, and so are four local authorities. A fifth local authority proposes to distinguish itself—the Skegness Urban District Council—by asking for the dual standard. The proposal will be met at Westminster and in Parliament with no small surprise after the fight last year over the Gas Light and Coke Company's appeal for relief from dual testing, and the establishing of their case to the satisfaction of Parliament. We see three other promotions in which testing is referred to, and which, at any rate in two cases, may refer to calorific power. The notices confirm our view that most promoters of Gas Bills will, as a matter of course, henceforth apply for the new standard. Speaking of Skegness, this is one of two authorities—the other being Chelmsford—who are taking advantage of the purchase clauses inserted in the Companies' Bills last session, and are now proposing to bring to a conclusion their desire to become the owners of the local gas undertakings. Three companies—Ascot, Ilfracombe, and Ormskirk—are asking for electricity supply powers. The first-named Company have already powers of supply; and these are additional. They also require sanction to the sale of power gas. The Dewsbury Corporation are wishful to obtain authority to sell gas in a crude or partially purified state to any company or person—for what purpose is not stated. The Smethwick Corporation, among other things, are seeking powers in relation to the testing of high-pressure meters and the amendment of the Sale of Gas Act—thus, we expect, following in the footsteps of the London County Council and the City Corporation.

Five of the notices contain references to co-partnership or profit-sharing; but the Brighton and Hove Gas Company, who are sticklers for having their actions authorized in black and white, prefer a request part of which is novel. The war suggests it. The Company desire to be authorized to subscribe or give a donation to any fund raised in a national emergency, or to infirmaries, hospitals, convalescent homes, exhibitions, or other institutions, or to benefit or sick funds of employees. United with this proposal is the granting of pensions to officers and servants. Then there follows provision for the payment of gratuities, pensions, or allowances to employees disabled, injured, or wholly or partially incapacitated, while serving with the forces engaged in war, or to the widow, family, or dependants of any such employees killed in action or dying of wounds or disease received or contracted in the war. The Brighton Corporation, after their experience in opposing the institution by the Company of employee benefit funds, are hardly likely to venture to Parliament this session on such an unpatriotic mission as trying to throw obstacles in the way of the Company's present request. If they do, they will richly deserve all they are bound to get in the way of contempt.

It is strange to find mention of gas powers in the notice given by the Plymouth Corporation, in view of the existence of the progressive Plymouth and Stonehouse Gas Company. The explanation is simple. It is due to the Three Towns amalgamation—Plymouth, Devonport, and Stonehouse, whereby the Devonport Gas-Works fell into the hands of the Corporation of Plymouth. The Sunderland Corporation are going to ask for powers in regard to subterranean distribution systems—among them gas-pipes. There is need to watch carefully the powers sought by local authorities in this regard. Last session some road authorities obtained protective rights to which they were not entitled—solely through promoters preferring concession to the defence of their common law rights. The feature of the session, in which we shall be incidentally interested, will be the gigantic electricity supply consolidation scheme of the London County Council, to which reference is being made to-day in our "Electricity Supply Memoranda." Restricted in the supply of energy for lighting purposes, the Yorkshire Electric Power Company are going to ask for relief, as well as for authority to supply in a number of urban and rural districts. There will be several local authorities up in arms against this; and the administrators of gas undertakings in the Company's area may be depended upon to look sharply to the protection of the interests of their undertakings.

There are to be a few applications under the Private Legislation Procedure Scotland Act. Here again calorific power supersession of illuminating power is found in the notices of the applications of the Cowdenbeath Gas Company and the Port Glasgow Corporation, the latter of whom are also after new works powers. The Forfar Corporation are proposing the lowering of their illuminating power standard; they might just as well go at once for calorific power. There will be some interest attaching to the scheme of the Lanarkshire County Council to set up a District Committee for the purpose, among other things, of gas supply. The applications to the Board of Trade for Provisional Orders are not numerous; and the features are not striking. The calorific power standard is noticed here and there; but chief in importance is the Order to ratify the agreed acquisition by the Liverpool Gas Company of the Fazakerly Gas-Works of the Liverpool Corporation.

Financing Gas Companies during and after the War.

IT was feared that the editorial article in the "JOURNAL" for the 3rd ult., on "The War and Capital-Raising by Statu-"tory Gas Companies," had fallen flat, and that no one considered the subject of the financing of gas companies during the period of the war, and while its effects on the Money Market continued, was of sufficient importance to trouble one's head over. It is gratifying to find one correspondent who has considered the position prospectively, and in consequence has come to the conclusion that it is a matter that should receive serious deliberation.

In his letter elsewhere Mr. W. R. Herring agrees that the Money Market, as a result of the war, will, as time passes, become more and more stringent, and the effects will continue long after the last gun in the conflict has sounded, and the last charge has been made. Moreover, the prices of gas-works materials on which capital expenditure is made are more likely to ascend than to descend. For some time to come, it is safe to predict, capital will not be raised by gas companies on the same terms as heretofore; and those operating under the sliding-scale who have to advance the price of gas through the effects of the war, will find their position for capital raising (in the very midst of an unprecedented demand for money) depreciated by the reduction of dividend consequent on the increase of the price of gas. What is the best method of meeting this position? The original suggestion in our columns was that Parliament should be approached, and asked to suspend the operation of the sliding-scale to the extent of the amount by which it may be requisite to raise the price of gas owing to the war, and for such length of time as the Board of Trade may consider that the effects of the war continue. In other words,

the proposal was that the dividend should not be disturbed to the extent of the increase of price directly attributable to the war, so as not to allow a reduced return to be one of the factors operating to diminish the market value of the capital, and its attractiveness to investors.

An alternative proposal is submitted by Mr. Herring. In his view, during the unsettled times, as the war loan indicates (although patriotism had something to do with the great triumph attending its issue), people will prefer security to high rates of interest or dividend. He therefore suggests that steps should be taken, in view of what is inevitable in regard to money, to enable statutory gas companies to raise a larger proportion of mortgage or debenture stock than the "Model Clauses" at present allow (with a corresponding cancellation of powers in regard to ordinary stock issues) at a rate of interest not exceeding 5 per cent., as may be determined at the discretion of the company. A debenture stock, with a rate of interest so much heavier than the normal, of course, ought not to be a perpetual charge upon a gas undertaking; but, as Mr. Herring suggests, powers could be conferred for redemption and re-issue on market conditions becoming favourable. The suggestion is a good one, and is put forward in a manner that must command consideration. Why, however, should not the suggestion run in company with the one made in the editorial columns on the 3rd ult., which (even if there were no new issues of ordinary or preference capital for a period) possesses the merit of maintaining—if profits and reserves permit—the dividend on the present capital at a time when claims press very heavily on small incomes. And a very large number of share and stock holders in gas companies are people of small incomes. Security in unparallel times is the strong commendation of Mr. Herring's proposal.

Educating the Steam-User.

THE gas industry is suffering to-day in the matter of coke sales from its supineness in the past. While things were going fairly comfortably in disposing of the coke produced, there was little thought of trying to expand the area of demand. New conditions have arisen—new processes of cement manufacture have restricted the demand for coke, and so has the greater use of gas for domestic and industrial heating; but the industry had nothing immediately ready to fall back upon, with the shrinkage of demand in these various quarters, to pick up the surplus coke, and so to maintain something approximately normal in coke sales. All evidence points to the fact that, if the work had been undertaken earlier to which, by force of circumstances, the industry has been driven in order to encourage and to assure new demands, we should not have heard the doleful note so frequently the past year or two as to the unpleasant position of the coke market and of stocks at works. Coke for steam-raising and for hot-water provision on the large scale are the (until lately) neglected directions in which, had the gas industry earlier devoted themselves to them, would have been found large absorbent markets for the surplus coke released by the shrinkage of demand in other quarters, and augmented by the high price of oil reducing water-gas manufacture, and the increased quantity of coal carbonized owing to this cause and to the extension of the demand for gas. The subject of steam-raising by coke was editorially referred to quite recently, following the excellent and informative series of articles contributed to our columns by "A Gas Engineer," in the last two issues of September and the first one in October; and we need make no excuse for again alluding to it, as it is of very considerable current importance.

The subject was reopened, and had further light thrown upon it, by the sketch which Mr. E. W. L. Nicol gave, in our columns last week, of his experiences in the technical work he is doing as part of the propaganda of the London Coke Committee. We do not envy our contributor the task that he has in hand. It may be highly interesting; but it is obvious that great patience and perseverance must be traits in anyone who ventures to attack such long-continued custom and neglected line of possible application. The work of displacing coal by coke for steam-raising purposes is one that must now be of comparatively slow growth for many reasons. But if only the slowness is accompanied by sureness, as it must be if the work is done intelligently and scientifically, this will be sufficiently gratifying, as good experience is an excellent advertising agent. The educative work that has to be done, the London experience proves, must be tackled with technical knowledge. Nothing else will do. The man without it will fall into innumerable traps, and do the cause more harm than good. Mr. Nicol has the requisite technical knowledge; and we want a Nicol in every district of the country, and more than one in some, to deal properly with this huge problem of extending the use of coke in the industries for steam-raising purposes. The modest reference, in the account published last week of Mr. Nicol's first year's work for the Committee, to the material success, as distinct from the educative influences, that has issued from the work, shows the largeness of the opening for coke business among steam-raisers, if only they can be converted from their old ways to the new. Traceable to the Committee's propaganda alone are "initial" sales of coke estimated at about 50,000 tons a year; and in the recent articles by "A Gas Engineer," converts were spoken of in the area in which he is concerned who are now firm buyers of about 10,000 tons per annum—all for steam-raising. The field for business is large; but, to enforce the point, it must be repeated that the field is not to be captured by mere platitudes, but by the proof of a good commercial and economic proposition.

Emphasizing this is one striking phrase in Mr. Nicol's article. Speaking of the need for practical tests under actual working conditions in order to carry conviction, he says: "The severity of these tests has often been accen-"tuated by a persistent conservatism on the part of those "responsible for the efficient conduct of the steam plant." This is what has to be faced. But we would rather that than an easy conquest and an ephemeral result. The more difficult the attack and conquest, the more careful and complete will be the methods applied; and when one can overcome the conditions that are most troublesome to subjugate, then the others will be comparatively easy. In the process of subjugation, the main thing, of course, is to show an economy for a given evaporative duty, apart from any concomitant benefit; but the person who undertakes to do this must be well primed with information lying at the very root of the matter. Many electrical engineers, for example, think that calorific power is practically the last word in deciding the superiority or otherwise of a fuel for steam-raising—in fact, they have a specification for purchasing coal on a calorific basis. In one electrical paper, too, we see a coal firm advertising that they can supply the right coal to electricity generating stations, because they specialize in high calorific power coal. A high calorific power coal may have but a relatively poor heating value for the purpose of steam-raising. It is patent that the education of users in the matter of fuel appraisement is sadly wanted; and it is through such education that they may be induced to have actual tests made, which, under proper conditions, cannot fail to shake their conservatism and supplement their knowledge. The table supplied in Mr. Nicol's article last week is exceedingly informative on points pertinent to this aspect of the question; and it should help to expose the fallacy as to calorific power being the one and only basis on which to purchase fuel for steam-boiler use. Although coke from high quality coal and graded may have a calorific value 1500 B.Th.U. less than anthracite or good quality Welsh coal, and an average gas coke a calorific value 3000 B.Th.U. less, still gas coke wins all along the line in the calorific value supplied for a penny, or for any other given cost.

This is satisfactory; but it is not the real explanation of why gas coke, under favourable conditions, is the superior of coal for steam-raising, and that is a point which most steam-users do not understand, have never attempted to understand, and will not understand till it has been brought before them, and its truth demonstrated. As a matter of fact, they have not had any occasion to consider, as the gas industry must give them occasion to consider now, why it is that a fuel of some 2000 B.Th.U. less value than another fuel can give equally good results in a suitably conditioned steam-boiler. Mr. Nicol points out that "the comparatively "high carbon and low hydrogen content of gas coke, com-"bined with its smokeless character, places it very high in "the scale of commercial values." In "A Gas Engineer's" articles, he also mentioned that much less air is required for the combustion of coke than of coal, owing to the absence of volatile matter. The enormous excess of air needed by the coal robs the boiler of a great deal of heat. In other words, the heat required for the volatilization of coal accounts for the expenditure of a considerable portion of the heat units contained in the coal; while soot deposited on the surface of the boiler is another source of loss. These are factors

accounting for what to some is phenomenal—the equivalent evaporative duty from a pound of fuel of lower calorific value than coal. These factors require to be driven home.

However, among the steam-boilers as at present equipped, the application of coke will have but limited area (though within the limits of consumption it would be substantial) without a step is taken beyond the educative one; and the London Coke Committee, realizing this, have taken the step in a very practical way. The necessity was early recognized; and at moderate price, Mr. Nicol mentions, there can be compliance with the necessity. To maintain an adequate rate of combustion with coke fuel, an inexpensive, yet efficient forced draught apparatus has been a desideratum, in order to supplement the inadequate natural draught. Such an apparatus has now been developed, and can be supplied and fixed in the London area "at a cost per "boiler that would in most cases be equivalent to considerably less than a week's supply of fuel." This is the statement in Mr. Nicol's article; and it can be readily verified. Alone this provision shows the comprehensive and systematic manner in which the Committee have been and are going about their work of converting steam-using factory owners from the errors of tradition, and of their past smoke-producing ways. The work of the Committee where effective through suitable conditions has a threefold advantage—it assists works' economy, it improves public environment by maintaining a cleaner atmosphere, and it extends the coke market of the gas industry. But the industry must have more of the work distributed throughout the country to make a sufficient impression on the market for its chief residuals.

The Vanguard of Gas Interests.

The art of making philosophical utterances breezy and interesting was well illustrated by Mr. W. M. Mason, the Secretary of the British Commercial Gas Association, in the address which he delivered last Friday evening to the London and Southern District Junior Association. But illustration of the art was not the object of the address, which, summed up, was a plea to the individual gas salesman for personal effort in reaching the highest attainable fitness for his important place in the world. We look upon gas salesmen as forming the vanguard of gas interests—the front or first line which comes in contact with the public, upon whose good opinion and consequent patronage the industry has to rely for its very existence. There was room for Mr. Mason's address; and it was opportune. The salesmanship side of the British gas industry is not by a long way all that it should be, nor what it will have to be, if the industry is going to properly meet its competitors. Competent gas salesmen will agree with this statement; we have heard some of those who are competent chiefs of gas sales departments themselves urging views in no uncertain way as to the essential qualifications of men required to advance the interests of the industry in and among the public. They would not have troubled to do this did they not know how deficient the industry is in properly equipped salesmen.

The gas industry stands in urgent need of men of good ability and attainments for this work; but the want does not at the moment—the more the pity—find expression so largely as we should like to see it through action on the part of gas managements in trying to secure such men, and in offering adequate remuneration for services. There may be a reason for this; but even reasons may be erroneous. It is, Mr. Mason in effect observes, one of the most short-sighted of mistakes that a gas management can make to suppose that cheap gas is the most effective factor in salesmanship—so effective, in fine, that all others may be disregarded. It is a factor; and so is the high efficiency gas-using appliance. A gas administration might just as well say: "If we get cheap coal and highly efficient manufacturing plant, then we have all that is necessary for the "production of cheap gas." The trained engineer rightly counts himself a factor in the production of cheap gas; the fully qualified salesman is a factor in the most fruitful promotion of gas business, with cheap gas and efficient appliances with which to work. "Give me," says Mr. Mason (with experience in a progressive gas department placing emphasis upon his words), "good service and a moderate "price, rather than low price and poor service for realizing "results, although good service and low price are still "better paired." But there must be the salesman—the man, specialized in the work, with the brain and the driving power to develop and maintain business.

The men required cannot be obtained from any material by mere tuition, but must be men of good parts and great ability; men of ambition, and men whose aspirations carry them beyond the first milestone of mere or even strict discharge of defined duty—the rendering to Cæsar the things that are Cæsar's, and nothing more—for their stipulated pay. The aspiration to pass the first mile in salesmanship will do more than anything else can do in developing a man to proper fitness not only for his immediate work, but for something higher. The source of true success, remarks Mr. Mason, "lies more inside a man than outside." Ability can be developed by outside influences; but the ability, and the desire for its cultivation, must be in a man—otherwise there will be no good result. Therefore much rests with the individual himself; and the address appeals to the individual to make himself as efficient as possible, and not to regard his place and service in life as being subject to rule and measure, with no possible beyond. Men who so regard place and service are men to be pitied. They are not men to "get on." They are the men who are always left where they were. They are men without any foresight. Salesmen may ask for some sign as to better material prospects, if they penetrate beyond the first mile. The men who ask for that are not the men to whom Mr. Mason appeals. The men to whom he appeals are those who have the capacity within them for constructive work—work in which they themselves supply the first material, and from which personal work they will issue better qualified and with the mark of indispensability on them. The indispensable gas salesman has an assured position; and for him the path to more lucrative reward has little or no obstruction in it. Let it not be forgotten that every man has his price.

We believe the time is coming when no gas undertaking of any pretensions will be without its responsible gas salesman, and when the competition will be keener and keener for the best salesmen—men who have even more than the characteristics and qualifications set out by Mr. Mason in his address. We wish he had placed more emphasis upon technical training—the training which enables the top man to know the inside of a piece of gas apparatus as well as he knows the outside, which enables him to determine the efficiencies of apparatus and judge of their other qualities, which enables him to advise with something more than the parrot-like recital of catalogue statement, which enables him to handle a pair of gas-pliers, and which enables him to measure well the strength and weaknesses of the appliances of competitors. Men of such qualifications are most valuable. They will be needed more and more. It was therefore excellent advice that Mr. Mason gave to gas salesmen—to get well beyond the first mile of bare duty.

Go as Willing Men.

They were fine, manly speeches that were delivered last Sunday week, by Sir Corbet Woodall, D.Sc., and Mr. Will Crooks, M.P., at a patriotic meeting which took place at the Beckton works of the Gas Light and Coke Company. Along with the gas industry generally, the Company have already done well in the matter of the number of men who have joined the Naval and Military Forces. But they can do even better; and the meeting the proceedings at which are reported in the news columns of this issue has proved a powerful aid to this end. During the speeches, between forty and fifty single young men came forward; and when the true meaning of the words that were uttered is fully appreciated, there will be further recruits—not alone at Beckton, for the power of the printed word has since been added to that of the spoken word. As Mr. Crooks pointed out, this is a war for liberty and for the home—not for other people's liberty and other people's homes, but for the liberty and for the homes of the very men to whom he was appealing. This is the cardinal fact. It is the safety of England, the very existence of the British Empire, that are at stake. There are other considerations which were forcibly advanced by the Governor—the war can only be shortened by the sending out of more, and still more, men; and those now in the trenches would have an easier time if larger reserve forces were available. These men and these reserves have got to be found. How? While admitting that one volunteer is worth several pressed men, still if the volunteers do not come forward in sufficient numbers pressed men must serve. Therefore, let those who are eligible respond forthwith to the Governor's exhortation to "go to-day as willing men, rather than wait for the command which will compel us, as though we went unwillingly, to fight for our country."

Coal Prices and the Sliding-Scale.

We are sorry that other of our readers have not discussed the suggestion made by Mr. John Kelly, of Bridlington, in our "Correspondence" columns on Nov. 17, regarding the incorporation, as part of the terms of the sliding-scale, of a standard price of coal, in order to protect the dividends of shareholders and the value of their capital—the ground for the introduction of this new factor being the permanent increase in the cost of coal due to legislation, together with the supposition that future enactments may tend more and more in the same direction. It was admitted by us that there was cause for complaint; but we did not like the introduction of complication into the sliding-scale. The tentative suggestion on our part, that a permanent slight increase in the standard dividend might meet the case, is rejected by Mr. Kelly; and he doubts whether a neutral zone would be sufficiently flexible to meet what he desires to accomplish—the raising of the price of gas, when the price of coal gets beyond a fixed standard, without affecting the dividend. It is difficult to see how Mr. Kelly's goal is to be reached without complication if the last-named proposition does not commend itself. Perhaps some other readers may be able to suggest a method; and if it looks promising, an attempt might possibly be made in a Bill to get Parliament to endorse it.

Further Considerations.

But Mr. Kelly himself, in arguing for the cause he is espousing, indicates some of the difficulties which would be met with in trying to persuade Parliament to revise the terms of the sliding-scale. Parliament will clearly not deal with suppositions as to the future. It will only take things viewed from the standpoint of what exists; and it would naturally be asked in what way the gas shareholder has suffered any more than the gas consumer under the sliding-scale from the legislative effects on the price of coal. Reserves which protect dividends have been trenched upon; but this has been due more to the coal strike and to the large demand for coal for export following the strike than to the actual effects of legislation. Is not the gas consumer under the sliding-scale company also suffering, in that any further recession of price to his advantage has been deferred owing to the incapacity of current profits alone to meet the dividends, and to large inroads having been made into reserves? There is little use in alluding to what happens in non-statutory industries; but there is large confidence in saying that Parliament would not consent to the placing of the whole increase of the cost of coal above a standard price upon the gas consumer, whether due to legislation *or otherwise*, without making the share or stock holder participate in it.

The Influence of Variable Coal Prices.

Mr. Kelly says it is not quite clear how the fixing of such a standard price might restrict a company's freedom in going to any source of coal supply. Prices in different coal areas vary. In one district for good class coals, there was not long since a rise of 2s. 6d. and 3s. a ton; in another district, for a different quality of coal, the rise was simultaneously only about 9d. and 1s. The purchase by (say) a southern company of the coal in the district with the larger rise might well have put the cost above the standard coal price, which might have been fixed in relation to another coal-field from which purchases had as a rule been made, and in which prices were always at a lower level than in the other field, owing to differences of quality. In consequence of this action, the interests of the consumer might be affected by the imposition (under the new condition) of an increased price for gas, which probably would not have occurred had purchases been made in the lower price coal-field with different quality raw material. Circumstances might also conceivably arise where the dearer coal might be the more profitable with which to work, owing, for example, to the conditions of the residuals markets. But the standard being fixed in relation to the lower price coal-field, the company might hesitate to buy the dearer coal, in order not to get above the standard coal price. Mr. Kelly will probably say, in that event, the rise in price of gas would be optional. Agreed. But Parliament would still require assurance as to the protection of consumers. We see Mr. Kelly now introduces another factor. The price of gas would not be raised so long as the dividend was earned. This being so, the company would have to wait until it was found whether the dividend could be earned before raising the price to the consumers; and the higher price of gas under the operation of the plan might then be ruling at a time when the cost of coal was below the standard. The more the matter is considered, the more involved the suggestion becomes.

The Dublin Precedent.

Mr. Kelly asks us to give him some particulars of the Dublin precedent. It was created in the session of 1909 when the Alliance and Dublin Gas Company were in Parliament. It was merely the subject of an agreement for three years between the Company and the Corporation, and so has now expired. It was formulated for the protection of the consumer, and not for that of the shareholder [see "JOURNAL," July 13, 1909, pp. 88, 95]. The price charged for gas to the consumer was to be reduced to 3s. 4d. per 1000 cubic feet. This price was not to be exceeded so long as the average price paid for coal was not above 13s. 6d. per ton c.i.f. The 13s. 6d. was the standard price. For every shilling the average price rose above 13s. 6d., an extra 1d. per 1000 cubic feet might be charged to gas consumers; and for every 1s. the price of coal fell below 13s. 6d., the charge for gas was to go down 1d. In this case supposing the price of coal went up to 14s. 4d. or 14s. 5d. per ton, and an increase in the price of gas was desirable, the Company were unable to raise it because it was short of 1s. above the 13s. 6d. This, of course, is not quite the same thing as Mr. Kelly has in view. But with this bargain we do not think the Company under their conditions lived very happily.

Private Bill Committee Reform.

The "Pall Mall Gazette" has called attention to a much-needed reform in the Committee stage of Private Bill work, in order to facilitate its more even flow, and make less strenuous the sessional lives of the leaders at the Parliamentary Bar, parliamentary agents, and engineering and other experts, with larger value to the promoters in the continuity of the attention received. Owing to the erratic way in the matter of time in which Private Bill Committee work is transacted in the Commons, it somewhat frequently occurs that leaders at the Bar are required in two, and sometimes more, rooms at once; the parliamentary agents' duties have to be delegated to juniors; and the experts have to dodge about from room to room. At other times there is an utter absence of business. The Committees of the House of Lords, it is correctly stated in our contemporary's article, are more methodical and constant in their sittings; while Commons Committees rarely sit now on Mondays, and there is a tendency to shirk work on Fridays. But we have observed a better grouping of late years, so that the bulk (say) of the Gas Bills over which there is contention get referred to the same Committee or Committees. This is an advantage. The fault, too, of irregularity is not always due to the Committees; sometimes it is attributable to Bills being shunted on one side to give additional time for negotiation with adversaries. However, there is a cry for reform among those chiefly concerned. One suggestion is that not more than two Committees from each House should be sitting at the same time; so that the work should be fairly distributed. Then in the present session, it is likely, owing to the circumstances of the time, the sittings of the Houses will be extraordinarily intermittent; and it is thought some continuity should be secured in the proceedings of the Committees by allowing them to meet when the Houses are not sitting. There is room for the better regularizing of Committee work.

Out of Season.

While denying that the strike is at any time a reasonable method of settling a labour dispute, it must be confessed that there are those who think—or say they think—the contrary. These latter are, of course, mostly trade unionists; for possession of the strength which organization bestows is too often of itself a temptation to use this strength. But admitting that there are two opinions held as to the principle of the strike, there can be only one view with regard to the taking of such a step at the present moment—that it is "out of season." Is it not enough that so many should prefer to stay at home while others are doing their fighting for them, without having to confess that extra difficulties are being caused by the refusal of men to carry on even their customary vocations? Yet the authorities at Neath have been gravely handicapped, at a time of unprecedented stress and strain for the whole country, by the cessation of certain Corporation services—including the gas supply. There is no intention here to enter

into discussion of the rights or wrongs of the dispute. Whether or not the men are entitled to the large advance in wages originally claimed (an offer to accept one-half on account was subsequently made on their behalf) may be a matter of argument; but there can be nothing else than condemnation for a policy of "down-tools" at the present moment. The country has its thoughts for the time being too much set on other things to pay a great deal of attention to the doings of the Municipal Employees' Association. But when once again it has leisure to think more closely of domestic affairs, no doubt there will be remembrance of what the Association may have done, or may not have done, while the nation of which it is a part—if only a small part—was engaged in a life-and-death struggle with a powerful and relentless foe. Ere these lines appear, the public will have learned that wiser counsels have prevailed, and that the men are back at work again. It is said on their behalf that the dispute has been going on for a twelve-month. If so, this is an argument rather against than in favour of the attitude that they took up; for, having "simmered" so long, it might well have been left to do so a little longer. More powerful trade unions than the Municipal Employees' Association have adopted a course which is in consonance with the feelings of the community at large; and we congratulate the Association on having now seen the wisdom of ceasing internal strife while the country is passing through so grave a crisis.

PERSONAL.

Mr. S. D. JACKSON, of Iron Bridge, Shropshire, has been appointed Working Manager of the Rugeley Gas-Works, Staffs.

Mr. THOMAS REILLY, the Gas Manager at Strabane (co. Tyrone), has resigned, owing to bad health, and has been granted a pension by the Urban District Council.

Mr. HARRY SIMCOCK, the Manager of the Biddulph Gas Company's undertaking at the time of its purchase by the District Council, has been unanimously confirmed in his appointment as Manager under the Council.

The Engineer and Manager of the Greenock Corporation Gas-Works, Mr. JAMES MACLEOD, F.I.C., F.C.S., was invited by the authorities of the Royal Technical College, Glasgow, to take up the lectureship on "Gas Engineering and Supply" for the present session, on account of Mr. Henry O'Connor being engaged on military duties; but pressure of work has prevented him from accepting.

Last Friday Mr. S. E. WHITEHEAD, formerly Works Chemist at the Windsor Street Gas-Works, Birmingham, was presented by his colleagues with a writing cabinet and a framed photograph of the Chemical Staff, on the occasion of his leaving Birmingham to take up duties as Chemist and Draughtsman at Southport. The presentation took place at the Council House—Mr. E. W. Smith, M.Sc. (Chief Chemist), presiding. In a short address, Mr. Smith congratulated Mr. Whitehead upon his appointment, and wished him all success in his new sphere. His work, he said, had always been of the best; and Southport was fortunate in securing such a man. Mr. Smith was supported in his remarks by Messrs. Twine, Pickering, Myhill, and Savage.

The *agenda* for the meeting of the Metropolitan Water Board last Friday contained several recommendations by the Works and Stores Committee in regard to the appointment of a successor to the late Chief Engineer, Mr. W. B. Bryan. The Committee said they were sure the Board would agree with them that it would be impossible to find an eminent engineer better qualified to fill the position than the Deputy Chief Engineer, Mr. J. W. Restler, M.Inst.C.E., formerly Engineer of the Southwark and Vauxhall Water Company. They pointed out that Mr. Restler had obtained "unrivalled knowledge and experience of the London Water Question;" and they proposed, with the utmost confidence, his appointment to the vacant office. Particulars were given by the Committee in regard to Mr. Restler's present salary and compensation under the Metropolis Water Act, 1902; and they proposed that he should be paid the salary lately enjoyed by Mr. Bryan and the amount of the compensation already referred to—making together £5747 per annum—on condition that while he holds the office of Chief Engineer the compensation is suspended, and that he is not to be entitled to make a claim to any additional or other superannuation or compensation. The proposals had been approved by the General Purposes Committee.

On his retirement from the position of Resident Engineer and Manager to the Eastbourne Gas Company, Mr. JOHN HAMMOND has been presented by the works staff and employees with an illuminated address and an album containing the subscribers' names. The presentation was made last Saturday week by Councillor Benjamin Bradford, who said it was a great pleasure for him to do so, at the wish of the employees. He referred in very appreciative terms to the honourable connection of Mr. Hammond with the Company during the past 27 years, and to the high value placed on his services by the Directors. The measure of his success as Manager of the Company was, he said, witnessed by the highly satisfactory working results, as recorded year by year. It was a matter for congratulation to all concerned that such excellent relations had always existed between employers and employed in the Company; and he could bear testimony to the harmony uniformly maintained between Mr. Hammond and the men under his control. He trusted that the loyalty which the men had shown to Mr. Hammond would be transferred to his son and successor, the present Manager, Mr. William Hammond, to whom he wished every success in his new duties. In returning thanks, Mr. John Hammond remarked that he would long carry the memory of this pleasant meeting with him. He could look back on many happy days spent with the men. He fully realized the difficulty of their work, and always appreciated the support they gave him. Mr. Hammond took a personal farewell of each man as he passed from the room. After expressing regret at Mr. Hammond's retirement, the address proceeded: "It is for others to speak of the conspicuous success which, during 27 strenuous years, has attended your unwearying efforts in the service of the Company. Our part is to place on record our recognition of the ideal of justice, combined with a sense of comradeship, which has throughout this long period animated your dealings with ourselves. While your resourcefulness in overcoming the difficulties and meeting the emergencies inseparable from a large engineering undertaking has won our constant admiration, your energetic and practical leadership—always unsparing of yourself—has acted as an unfailing incentive to give of our best in the carrying out of our daily duties. In bidding you farewell as our chief, we should like you to carry into your well-earned retirement the assurance of our sincere respect and affectionate regard. Added to this is our hearty wish that you may live to enjoy many years of health, happiness, and usefulness; and in this wish we should like to include Mrs. Hammond and Miss Hammond, of whose practical kindness and sympathetic interest we have had many proofs."

OBITUARY.

It is reported that the death took place on Oct. 24, at Carlsruhe, of Herr FEDOR KELLNER, who was formerly Manager of the gas-works at Mülhausen, in Alsace.

The "Journal für Gasbeleuchtung" records the death in action in France on the 23rd of August last, of Herr WALTER ERBE, the Engineer of the gas and water works of the Corporation of Wiesbaden. Deceased was a Lieutenant in an Infantry Regiment.

The sad news of the death of Miss ETHEL FEARNLEY, at the Base Hospital in Boulogne, has been conveyed by the Secretary of State for War to Mr. and Mrs. R. Fearnley, of Gibraltar, of whom she was the eldest daughter. Miss Fearnley, who was a trained nurse, accompanied the Expeditionary Force to France, where she was afterwards continually employed in nobly serving her country by attending the wounded in field hospitals, in Red Cross trains, in hospital ships, and finally in the Base Hospital. Only the day before hearing of her death, her parents received a letter which showed she was hard at work and in good health.

We regret to announce the death of the Chairman of the Wakefield Gaslight Company, Dr. W. A. STATTER, J.P., on Sunday, the 22nd ult., after a long and painful illness. Dr. Statter was elected Chairman of the Company in 1896, in succession to his father, Dr. William Statter, J.P., who was Chairman from 1847 until his death. Thus father and son between them covered the long period of 67 years. The late Dr. W. A. Statter was a man of singularly loveable disposition, who endeared himself to all with whom he came in contact. He was generous and unselfish to a fault. He took a very prominent part in all philanthropic movements in Wakefield, and also in connection with the medical profession. Members of the Manchester District Institution of Gas Engineers will doubtless remember him; for he presided at the luncheon given to them by the Wakefield Gaslight Company when they visited Wakefield in 1901. The funeral took place on Thursday last, and was largely attended—among others, by the Directors, officers, and workmen of the Wakefield Gas Company.

Scottish Junior Gas Association (Western District).—At a meeting of the Association in the Royal Technical College, Glasgow, next Saturday evening, Mr. A. Wright, of Lockerbie, will read a paper on "Experiences in Small Gas-Works." A Roll of Honour of members who are serving in H.M. Forces is being prepared, and will be hung in the room on meeting nights. The names of fifteen members so serving have already been handed in to the Hon. Secretary (Mr. James Cubie).

Masonic.—At last Wednesday's meeting of the Evening Star Lodge (No. 1719) the election took place of the W.M. and the Treasurer for next year. The Senior Warden, W. Bro. A. E. Croager, was unanimously elected Master; while W. Bro. Arthur Valon, L.R., was reappointed Treasurer.——Last Tuesday the annual meeting of the Elland Lodge of Mark Master Masons was held, when the ceremony of installing the W. M. (W. Bro. E. J. King) was performed by W. Bro. J. E. Horsfall. Subsequently, the address to the officers of the Lodge was given by W. Bro. J. W. Broadhead, Grand Senior Deacon of England. Among the brethren advanced in office were Bro. R. M. Brooke and Bro. H. J. Toogood. Among the visitors present were W. Bro. E. B. Drake, Provincial G.S.D., and W. Bro. E. J. Wellens.

THE GAS INDUSTRY AND THE WAR.

Dealing with the progress of recruiting, "The Times" last Tuesday made the following reference to the Gas Light and Coke Company: "In pleasant contrast with the footballer's apathy was the result of a meeting at the Beckton Gas-Works on Sunday. Mr. Will Crooks, M.P., to whose efforts the recruiting officers pay a grateful tribute, made a speech to the men at these works and fifty joined 'on the nail.' Others may be expected to enlist during the week. The authorities would be glad if other employers would note the result thus achieved, and give facilities for their men to be addressed. There is yet another way in which employers can help. Men have told the recruiting officers that they cannot join because employers now decline to guarantee them their posts when the war is over. The authorities appreciate the fact that not all employers are in a position to pay salaries or part salaries during the war; but an earnest appeal is made that the men's places should be guaranteed to them on their return. It is incredible that the men who take the place of volunteers during the war should feel aggrieved if, when the soldier returns, his post is given back to him." A report of the proceedings at the Beckton meeting appears on p. 491.

Readers will be interested to know that Mr. Thomas Glover (Messrs. Glover and Main, Limited) some time since undertook the responsibility for special constabulary work, and has been appointed an Assistant Commander of the "N" Division, which covers Walthamstow, Lea Bridge, Chingford, and Edmonton.

Mr. A. E. Schultz, only son of Alderman W. A. Schultz, J.P., has been gazetted as Second Lieutenant in the Eleventh Staffordshire Regiment.

Mr. G. D. Bidwell, who has recently been acting as agent for Messrs. Falk, Stadelmann, and Co., is among those who have answered their country's call. He has been given a commission as Lieutenant in the Fifth Battalion of the Wiltshire Regiment, which is stationed at Tidworth.

Mr. E. Rowson, son of Mr. F. G. Rowson, a Director of Messrs. Fletcher, Russell, and Co., Limited, received a commission early this month as Lieutenant in the Fifth South Lancashire Regiment (St. Helens). Lieutenant Rowson served his articles as a civil engineer, and is now a barrister-at-law, with chambers in Liverpool. It may be added that about 200 of the employees of the firm have already joined His Majesty's forces.

Dr. E. Schilling, of Munich, who is the representative in Southern Germany of the Central Gas Publicity Organization of Berlin, recently received returns from gas undertakings as to the consumption of gas during August last. The returns from 526 works show an output in that month which was 5·8 per cent. less than the output in August last year. The note in which these figures were given in the "Journal für Gasbeleuchtung" recently pointed out that the reduction in consumption has varied very greatly in different places, according to local conditions. It is remarked that, as petroleum is becoming very scarce in Germany, this is a good opportunity to persuade petroleum users to become gas consumers.

At last Friday's meeting of the London and Southern District Junior Gas Association, the members listened with great interest to the reading by Mr. W. J. Liberty of the following letter which he had received from Mr. Douglas H. Helps, the Engineer and Manager to the Reading Gas Company: "I hear that you are compiling a Roll of Honour of the members of your Association who are now serving with H.M. Forces, and so I am sending you the following particulars with reference to my Junior Assistant, Mr. H. M. Brown (Lieutenant). Previous to the outbreak of war, he held a commission in the Officers' Training Corps; but directly trouble commenced he was attached to the Third Leicestershire Regiment. Some three or four weeks ago, he was placed in charge of a draft of men from the regiment, and sailed with sealed orders to reinforce the First Battalion of the Leicesters; and he is now right up at the front. He is only about 21 years of age, but quite a good soldier, and such an excellent fellow. We all hope he may get through to Berlin and return safely to us. Needless to say, my Directors—as in the case of all our employees—are keeping the position open for him. We have about fifty of our workmen and staff with the forces."

The financial aspect of the war was the subject of an address delivered by Professor H. S. Foxwell (Professor of Political Economy in the London University) at the Manchester University last week. He said he thought the tendency was to prop-up the old prices and keep things going until trade recovered itself, in the hope that prices and values would also recover. It would be well to recognize facts, and realize that we must submit to a loss of capital value on securities. Experts had concluded that the cost of the war, if it lasted a year, would be 3000 million pounds, and perhaps more. This was equal to more than four years' normal output of securities for all purposes; yet it took no account of the needs of trade, but was simply for the out-of-pocket expenses of the war. With this enormous extra supply of securities created, the price of securities would fall. He had no hope that the price would recover, at least for ten or twenty years. Therefore, instead of bolstering-up artificial capital values and clogging the wheels of trade and finance, it would be better to recognize the situation. It seemed to him that our position was superior in every way, financially, to that of Germany.

Birmingham will have to do with less light, the Chief Constable having received an order to this effect from the Home Secretary. Some weeks ago, at the request of the Admiralty, the Chief Constable was asked to take steps to prevent the use of powerful lights and sky signs which might be visible from a distance. This he did, by issuing a notification; but it is stated that "there has not been anything like a general response" by the persons concerned. Of course, many people did what they could to meet the wishes of the authorities; and the Gas Committee greatly reduced the high-pressure lighting in Victoria Square. The new order, which will no doubt receive a "general response," is made under Regulation 7*a* of the Defence of the Realm Regulations, and is in the following terms:—

1.—All sky signs and conspicuous illuminated lettering and powerful external lights used for advertising or the illumination of shop fronts shall be extinguished.
2.—In brightly-lighted streets and squares a portion of the powerful lights shall be extinguished or lowered, and all lights which are not extinguished shall be shaded or obscured so as to cut off direct light from the lamp in all directions above the horizontal.
3.—All large lighted roof areas shall be covered over or obscured, or the lighting intensity reduced to the minimum possible.
4.—The lights of tramcars and omnibuses must not be more than is sufficient to enable fares to be collected.

Accompanying the order was a memorandum informing the Chief Constable that the Admiralty advises that preparations should be made so that in case of emergency a more general reduction of lighting can be enforced on the lines at present adopted in London. It is requested that steps should be taken to this end, so that, should the occasion arise, there will be no delay in complying with a further order.

In connection with the London restrictions, it will be noted that there is no idea at present of relaxing the regulations. Replying to a question on the subject in the House of Commons last Tuesday, the Home Secretary said that in this matter he acted on the advice of the Admiralty; and in their opinion the regulations could not be at present safely relaxed. He added that a warning had already been issued by the Commissioner of Police as to the necessity of carefully driving through the dimly-lighted streets; and he hoped that drivers of all vehicles would show a proper public spirit, and comply strictly with this injunction. The darkness of London is, says Sir Cecil Hertslet (British Consul-General for Belgium) as nothing compared with what the darkness of Antwerp was after a devastating visit from a Zeppelin. At the time of the attack, the city was brilliantly lighted, and every bomb dropped close to the building aimed at. So on the following day orders were given for all lights to be put out at 8 p.m. When the second Zeppelin came, it did scarcely any damage at all. In fact, he added, darkness proved a very efficient protection against Zeppelin raids.

In reply to a question in the House of Commons as to whether it was the intention of the Government to assist in the organization of the supply of aniline and other dyes, Mr. Runciman gave a brief indication of the official view. The inquiries of the Government, he said, had led them to the conclusion that the excessive dependence of this country on a single foreign country for materials of such vital importance to industries in which millions of workpeople were employed, constituted a permanent danger, which could only be remedied by a combined national effort on a scale which required and justified an exceptional measure of State encouragement. Accordingly, the Board of Trade had entered into consultations with the principal interests concerned, with a view to the elaboration of a scheme for the establishment of an undertaking for the production of synthetic dyes and colours. In the main, it was hoped that the capital required would be forthcoming from the industries by which dyes and colours were mainly used; but the Treasury were prepared, within certain limits, and subject to certain conditions, to afford financial support to a well-considered scheme which would be permanently under British control.

What the Chief Constable of Scarborough has described as "a somewhat drastic order" has been issued by the officer commanding the troops in the town. It is in the following terms, and makes it clear that after 6 p.m. no interior light of any sort is to be visible from the outside of buildings.

> In virtue of powers conferred on me as the competent military authority under the Defence of the Realm Act of Aug. 12, 1914, I hereby require all blinds or shutters in all dwelling-houses, shops, warehouses, public-houses and hotels, factories, and garages to be drawn down at 6 p.m. every evening. All lighted buildings must also arrange to screen skylights and glass roofs.

The street lighting in Scarborough has been modified for some time past by obscuring the top lights of lamps and by the non-lighting of some of the lamps; but within the last two or three days a further step has been taken of having all the lamps extinguished after 11 o'clock at night.

ELECTRICITY SUPPLY MEMORANDA.

Electrical Ambitions; and the World's Needs.

ENVIRONMENT often has an effect upon the broadness or otherwise of the views taken of general affairs. Some electrical men, through being brought up in the narrow belief of a destined universality of electricity, harbour the grotesque idea that all other of Nature's gifts supplying light, heat, and power to the world are to be relegated to oblivion. All else but electricity appears to have been nothing but side-slipping on the part of Nature. Mr. P. P. Wheelwright is Chairman of the Manchester Section of the Institution of Electrical Engineers; and he has lately delivered an address inaugurating his year of office. In this he refers to the question of smoke abatement, and to the live interest that is being taken in it, or was being taken in it, until the war created temporary diversion. Up to the present, he said the matter has been dealt with in only a superficial manner; but there is a practical solution whenever the Government care to enforce it. Need we ask what is this "practical solution?" Mr. Wheelwright addressed himself more particularly to industrial areas, with their forest of smoke-yielding works' chimneys. Nothing was said about the shafts of electricity generating stations. The amount of coal fed into the furnaces of the factories during twelve hours of every working day, he mentioned, reaches a considerable figure, and this is supplemented by the banking-up of the fires during the week-ends. The purchase and delivery of solid fuel in this scattered manner in comparatively small quantities constitute an uneconomical process; while if all the coal was delivered at one place, and power was transported in a different way, there would be greater economy. Of course, the only centre of reception in Mr. Wheelwright's eye is an electricity generating station from which energy could be distributed throughout the district. Thus all small power generating plant would be removed, and the smoke nuisance at once considerably diminished. Simple, but incomprehensive of alternatives. There is another way. Power for driving is not the only thing for which fuel is employed in factories; heat is an essential. Mr. Wheelwright does not mention this. If his suggested concentration of fuel delivery was made at the gas-works, gas could be distributed to every factory; and the small electricity generating plant for economically providing current for any purpose—lighting or power—could be supplied with gas for driving without creating any smoke. The same gas would give factories the heat required for metallurgical and other purposes. There is another matter which he overlooked. The Government and the manufacturers requiring synthetic dyes and colours (which are absolutely essential to the life of various industries) are considering a scheme for making this country in future independent of Germany. If the scheme develops, all the surplus tar obtained in the normal course from the carbonization of coal will be wanted. Tar is a fundamental necessity in this and other directions; and gas, smokeless coke, and sulphate of ammonia must also be produced in securing the tar. Something has to be done with these valuable things; and among the uses of the gas is the generation of electricity as a "secondary product," as practised on gas-works to-day. The war is likely to put coal-carbonization interests in even a stronger position than before in the country's economic system. However, Mr. Wheelwright overlooks these matters; and he hints that, when the industrial question has been electrically dealt with, then domestic fires will have to be taken in hand in a similar manner. The gas industry hopes to be allowed to exist, and is conceited enough to believe the world cannot do without it, as the world finds more and more with every passing day.

Electric Heating Theories.

There is an amusing story to be found in the "Correspondence" columns of the electrical papers which had its origin in an equally amusing advertisement issued by Messrs. Belling and Co., who, though they describe themselves as "specialists in electric heating," do not (according to the evidence of the advertisement) appear to be friendly with the true principles of heating. The announcement seems to imply that radiant heat dries up the moisture in the atmosphere, and causes irritation of the nose and throat. At any rate, this is the construction put upon the wording of the advertisement by other electric heating specialists. A further Belling statement was that radiant heat thrown in every direction makes excellent toast." One of the firm's trade competitors—the Jackson Electric Stove Company—humbly opines it would be better to throw the heat in the direction of the toast, and so would most people who know anything of heating. Ferranti Limited, also dealing with the curious advertisement, state that they are working to make their heating productions give as much radiant heat as possible. Then Mr. F. Barron, an electric heating engineer, and formerly with the Carron Company, says that it is only radiant heat of high temperature which is responsible for any distress experienced in the drying-up of the air of rooms, combined with an absence of air in motion. Another writer "C. W. C." thinks the gas friends of the electrical industry must have been gleefully "bucked up" on perusing the Belling advertisement, as it indicated that all electric-fires but one are wrong, and that by using any other electric-heater than the one, the users run grave risk of detrimentally affecting their respiratory organs. The application and advertising of the Belling theories on heating will not very much assist the electrical industry with their uphill work with electric-heaters, which the public knew best as complying with the two extremes of costliness and pitiable heating effects, especially in the latter regard when the atmospheric temperature is low. Many shivering users have turned for relief to the modern gas-fire, which gives a considerable percentage of radiant heat. It is convected heat that dries up the moisture of the atmosphere, and causes irritation of the respiratory organs. The makers of gas-fires for long moved along a mistaken track in design; but they mended their ways a few years ago—suppressed the convected heat to minor proportions, and succeeded in raising the radiant heat to the major place. The small balance of heat—20 per cent. or so of the total heat of combustion—passing away with the products, does what Mr. Barron says is essential, keeps the air of the room in motion. Hence the booming popularity of the gas-fire.

Cheap Units and Cheap Apparatus.

The discussion (referred to last week) at the meeting of the Point-Fives has caused Mr. A. Nichols Moore, the Electrical Engineer of Newport, Mon., to write to the "Electrician." This gentleman cannot yet see clearly that the policy of the 0·5d. tariff is one that can be universally applied by electricity undertakings; and he has not hesitated to express his views. The discussion at the meeting of the Point-Fives was in a measure a ratification of the position he has taken up. Mr. Pickvance, the Chairman, confessed that the Point-Fives tariff has not done him much good in the way of developing his domestic load; and he is not the first one to make similar admission. Something more is wanted. Units cannot be sold at low prices, philosophically says Mr. Moore, without they are sold in large quantities. At the Point-Fives meeting there was, and in Mr. Moore's letter there is, the acknowledgment that until the prices of domestic electric appliances are lower than they are at present, the sale of current in large quantities for domestic purposes will not be achieved. It is something to have this admission from men who at one time thought they were going to have a walk-over with nursery-like fables about solid "meat" evaporating and "poisonous" fumes escaping. Mr. Moore thinks the makers of electrical domestic appliances put an unreasonable margin of profit on their goods. Surely the large competition in the industry prevents them doing this. We hardly think that Mr. Moore has any great appreciation of the cost of the materials and of the labour involved in producing some of the electrical appliances on the market. The gas-cooker is a simpler thing than the electric-cooker; and the opportunity afforded us a time ago of going into the average costs of producing gas-cookers opened our eyes a bit as to actualities. Regarding domestic electric appliances, Mr. Moore, while claiming for them commendable points, says it is true some of them have a "good many" bad ones. However, it is urged that municipal electricity undertakings should go in for hiring powers, which are considered more important than wiring powers. But as we have before pointed out, fairly heavy rentals would have to be charged, as ½d. per unit could not support the load of part of the capital and maintenance costs of electrical apparatus. As it is, the ½d. cannot stand upright alone.

The Engulfing Scheme.

By their scheme for the electric supply of London, the County Council are proposing to put into the shade all else that has been electrically attempted in this country, or for the matter of that in any other. The parliamentary notice has been published by the Council for the creation and authorization of a statutory company to be formed and worked under the palladium of the Council. Now that we have the area roughly defined within which it is proposed that this Council-reined company shall operate—an area including not only the county of Middlesex, but numerous towns in the counties of Hertford, Buckingham, Berks, Surrey, Essex, and Kent—we have a better perspective of the really colossal character of the new venture. Were there no opposition from internal interests let alone external interests, a Parliamentary Committee might very well be staggered by the monopolizing impudence of the project. All the electrical enterprises in the Metropolis, the encircling suburbia, and beyond, within the area sought, individually look puny and scrappy beside the magnificence of the scheme. As sure as anything can be, there will be mighty allied forces arrayed against the Council; but the Council may take to themselves the glory of doing something to relieve what will be, consistent with prior expectation, a very lean Private Bill session. There are some professional men at Westminster who will bless the Council; there are numerous bodies throughout the mapped-out area who will do the contrary, particularly in view of the mind-absorbing conditions that rule to-day.

Speculative and Incomplete.

The notice proposes the incorporation of a Company to exercise any power in regard to the electricity supply in or near London which may be conferred on the County Council or other public authority. The Company, it is intended, shall lease, carry-on, and manage the undertaking, and find a proportion of the capital—the County Council also guaranteeing capital. All ordinary electricity supply powers are contemplated; and provision is made for the control of the Company and of the funds. Large generating-stations are of the plans, with purchase of company electricity-supply undertakings, and the

purchase or leasing of borough council concerns. Fourteen companies are mentioned for transference or vesting in the new Company, or failing the lot any one of them; but the borough councils with electricity supply concerns are not specifically named in the notice. Option as to coming into the scheme at the present time will, it is understood, rest with the suppliers; and no one yet seems to know whether any, or if any which, of the undertakings will join to form the nucleus of the scheme. But there will be eventual engulfing of the whole lot when their statutory life has run its course. In view of this, the Council want some sort of control over the fresh capital expenditure of the outstanding ones, and we suppose a voice in the determination as to whether, when additional capacity is wanted, present stations should be extended, or supply in bulk be obtained from the stations of the new Company. It is about the most inconclusive scheme that the Council could have adopted. There is no cohesion or completeness anywhere. It merely contemplates a huge growth over years on a foundation speculative and fragmentary.

Electricity Supply and a Sliding-Scale.

A point of interest is a proposal to apply a sliding-scale of price and dividend in the case of the new Company. We think this is an innovation in electricity supply. In the report of Lord Cross's Committee in the session of 1898, one passage reads: "In cases of exemption from liability to purchase, it would be specially expedient in the interests of the consumers that some kind of sliding-scale, as in the case of the gas companies, should be imposed." Though this was the suggestion in 1898, there are, to the best of our knowledge, no local electricity supply companies who are exempt from purchase at some period or other; and so, we fancy, there has been no experience in the matter of the application of the sliding-scale to electricity supply. As a matter of fact, with the widely divergent prices charged for electricity by almost every undertaking, it seems to us there would be some difficulty in devising a workable scheme. In the case of gas, the standard is fixed in relation to the ordinary price charged for domestic purposes. But which is the ordinary price in the case of electricity concerns? In some districts the major part of the output is sold for power purposes, and at prices per unit from under the average fuel cost per unit up to (say) 1d. or 2d. per unit, while the ordinary lighting consumers may be charged 5d. or 6d. per unit. How would a standard price be fixed in such a case? Again, under a scheme like this, how would a fixed price on the rateable value of the premises and (say) ¼d. per unit stand? How would it work in relation to a sliding-scale of price and dividend? It is a pretty proposal the development of which (if ever it is developed) will be of considerable interest. But there is another aspect of the matter. We suppose it is intended that some day the Council or rather some other public authority will take full control of the concern, when the Company have done all the spade work and have conglomerated the whole of the electrical interests in and about London, by the suppliers dropping into the scheme of their own volition or through the effluxion of the statutory life of their undertakings. If this be so, what would happen to the sliding-scale of price and "dividend," seeing that the Council or public authority would be paying an average fixed interest on their loans. It is seen that according to the notice the Council propose an alternative to the sliding-scale proposal. The notice says: "Or the Bill may provide for, and require the Company to give, a rebate or discount upon the amount payable by the consumers, proportionate to the amount by which the dividend payable by the Company on its ordinary capital exceeds such rate per centum per annum as may be prescribed by the intended Act." The intention of the Council is good; the manner of giving effect to it appears to us to be fraught with much difficulty, principally owing to the widely divergent charges there will be for the tremendous bulk supply, power supply, heating supply, cooking supply, and lighting supply of which the Council have had visions. The Council have a wonderful faculty for building castles in the air, just like a certain royal personage who among his "castles" has seen himself the supreme ruler of the world. At the moment, the vision is as near as he will get to the coveted position. Whatever happens to the County Council scheme, it may be at once taken for granted that Parliament will hardly be disposed to give a Company, living under the protection and control of the County Council, supply powers and privileges over areas in which the Council have no jurisdictional rights. That is one excuse for proposing the constitution of an *ad hoc* public authority, to work in conjunction with the Council.

Oil Gas in San Francisco.—The new President of the American Gas Institute (Mr. E. C. Jones, the Chief Engineer of the Pacific Gas and Electric Company), who is also President of the Pacific Coast Gas Association, in inviting his colleagues to the West for next year's meeting and the International Gas Congress to be held at the Panama-Pacific Exhibition, told them that when they get there they will find a process that will make oil gas practically without residuals. His Company are building the two largest sets in existence, 18 ft. 9 in. in diameter and 63 feet high, each capable of producing 5 million cubic feet of gas in 24 hours. The operation will, he says, be almost automatic. The two sets will be operated from tables from which all stack-valves and blast-valves will be worked mechanically, every valve for gas, steam, and oil, with pyrometers, oil-meters, and steam-meters, being directly under the eye of the operator.

THE LAST GAS EXAMINATIONS.

Report of the City and Guilds of London Institute.

We have received from the Superintendent of the Department of Technology of the City and Guilds of London Institute (Sir Philip Magnus, M.P.) the report on the work of the department during last session. We extract some particulars as to the general work and the examinations in "Gas Engineering" and "Gas Supply."

General Work of the Department.

In the course of the remarks with which the report opens, it is mentioned that the Department of Technology suggests schemes for complete courses of evening instruction for artisans and others engaged in different industries, and prepares detailed syllabuses in the technology of each trade subject. The programme recently issued contains seventy-nine syllabuses, including courses of instruction relating to upwards of a hundred branches of industry. In several subjects, the syllabus of instruction is carefully arranged in sections, which are specially adapted to different branches of the trade and to the needs of localities. Thus the syllabuses in "Gas Engineering" and "Gas Supply" include syllabuses of separate courses in each of the subjects named. A new syllabus in the subject of "Gas-Fitting" was added in the issue of the programme for the current session; and the department acknowledge the valuable help given in its preparation by the Institution of Gas Engineers. In Grade II. and the Final Examination in this subject, a preliminary practical examination will be held at local centres next year between the 8th of February and the 6th of March; and it will be necessary for candidates to pass this examination in order that they may be eligible to take the written one. Before publishing each year's programme, the syllabuses are submitted to experts in the several subjects, so that each suggested course of instruction may contain notices of the most recent discoveries and applications of science to the industry with which it is concerned.

Special attention is directed to the reports of the examiners in the separate subjects which are contained in the volume; and it is pointed out that in many cases they have been enabled to draw conclusions, from the written answers and practical exercises of the students, as to the causes of their failure, and the character of the instruction they have received. Certain of the reports will be found to contain suggestions of very general application. Teachers are advised to keep their knowledge thoroughly up to date by studying the "Transactions" of the leading technical societies and institutions, and articles in technical journals, and not confine themselves to text-books.

As showing the extent of the work of the department, it may be mentioned that at the recent general examination in technology 23,119 candidates were presented from 467 centres in the United Kingdom; and 14,570 of them passed. These figures show an increase of 1241 in the number of examinees, and of 952 in the number of those who passed. By including the candidates from India, from the Overseas Dominions, and from other parts of the British Empire, those for the special examinations in magnetism, electricity, cookery, and needlework, and those for the teachers' certificates in manual training and domestic subjects, the total number of examinees was 26,776. As readers may remember, in order to secure the expert advice of trade societies and professional bodies in the conduct of the department's educational work, the Institute have arranged for the formation of several Advisory Committees, consisting of persons interested in, and having full knowledge of, technical details in various trades and industries. The Council of the Institution of Gas Engineers act as an Advisory Committee in the subjects of "Gas Engineering;" "Gas Supply," and "Gas-Fitters' Work." By the aid of these Committees, the Institute are enabled to obtain the services of the most competent examiners, to assist in securing industrial efficiency, and to promote useful relations between trade organizations and the schools in which artisans and others receive their technical instruction.

In the subjects of "Gas Engineering" and "Gas Supply," the number of students rose from 1042 to 1315, and that of the candidates from 816 to 969, chiefly through the increase under the heading of "Gas Supply."

Statistics of Results.

Turning to the tables which give the results in the separate subjects, the report shows that in the two relating to gas there were 45 centres, with (as already mentioned) 1315 students in attendance. The candidates numbered 296 in "Gas Engineering," and 673 in "Gas Supply," compared with 278 and 538 before. In the Final Examination in the former subject, 56 passed in the first class, 42 in the second class, and 28 failed; while in the grade next below, the passes were 45 and 50 respectively, and the failures 75. Thus there were 193 passes and 103 failures, or 34·8 per cent. In the Final Examination in "Gas Supply," 49 candidates passed in the first class, 104 in the second, and 73 failed; while in the grade below, 241 passed in the first class, 123 in the second, and 83 failed. There were thus 517 passes and 156 failures, or 23·1 per cent. It is remarked in the report that the percentage of failures in Grade I. in "Gas Engineering" is higher than last year; but in the Final Examination the first-class passes are more

than usual, and the total percentage of failures is low. In "Gas Supply," in spite of the large increase in the number of students in Grade I., the results were satisfactory.

Of the total number of students in the two subjects, 4 passed at the Battersea Polytechnic in "Gas Supply," in Grade I., and 2 in the Final Examination. At the Goldsmiths' College, out of 23 students in attendance, 14 were examined and passed in this subject—3 in the final and 11 in the grade next below it. At the Northern Polytechnic, one candidate was examined in "Gas Supply," and he passed in Grade I. From the classes at the Regent Street Polytechnic, 46 students out of 57 were examined in "Gas Engineering," and 38 passed—15 in the final and 23 in the grade next below it. In "Gas Supply," one candidate was examined, and he passed in Grade I. From the various schools of the London County Council, out of 359 students in attendance at classes for the two subjects, 186 were examined in "Gas Supply," and 139 passed—43 in the Final Grade, and 96 in Grade I. In "Gas Engineering," 9 were examined, of whom 8 passed—all in Grade I., and one was a prize winner.

Reports of Examiners.

Reporting on the work of the students in "Gas Engineering," the Examiner (Mr. Thomas Glover, of Norwich) says:

Some of the work done in the Grade I. examination was of high quality, particularly the answer given to Question 5, where a sketch of a set of water-cooled condensers was asked for. One group of students appears to have been very well instructed on this subject, and many sketches of first-class order were produced. Another set of students making the same drawing fell into the error of continuing the diameter of the annular inlet and outlet throughout the body of the condenser. This suggests some fault in the drawing used by the teacher. The fire-goods question was well done in many cases. Students should be instructed to give concise answers. Much of the examiner's time is wasted in wading through discursive essays, where the answers could be better given much more briefly.

The work done in the Final Examination was, generally speaking, very satisfactory; and the drawings were in some cases of first-class quality. The chemical questions were, on the whole, answered accurately.

There are clear indications that students benefit by attending classes and coming under the instruction and influence of good teachers. Isolated students are at a disadvantage, and should use every effort to associate themselves with other students; and it is important that all students should take every opportunity of visiting works and cultivating their powers of observation.

Mr. Walter Hole, the Examiner in "Gas Supply," reports

Grade I.

Although the number of students has largely increased, yet this increase has not been attended by any lowering of the standard of excellence in Grade I. The students have been exceptionally well prepared, and have, on the whole, acquitted themselves admirably. This is seen in the very large proportion of those who have attained a first class.

The principal weaknesses revealed in this grade have been the inability of many students to understand the significance of the pressure chart given in connection with Question 8, and the imperfect acquaintance with the rudiments of combustion which many of the answers to Question 7 revealed. Attention was drawn to the latter subject in a previous report. While it is only fair to say that the answers to this question show a marked improvement upon those to Question 5 of last year, which was similar in character, still the results in the present year in this respect leave something to be desired.

Final Examination.

It is impossible to speak so highly of the work in the Final Grade. While there are a large number of very good papers, some of which show marked ability, the average is distinctly below that of last year, and relatively much lower than in Grade I.

The failures in this division have been principally in relation to Questions 5, 6, 8, and 10. In connection with No. 5, many students have contented themselves with giving haphazard or rule-of-thumb answers, without troubling to work out their conclusions from the data of the paper. The answer to Question 6 showed that, although many of the candidates worked out their calculations correctly, only ten were able to put their results in the form of a polar curve on the ruled paper provided. A large number of answers to Question 8 showed quite an inadequate conception of the quantity of light required, and the lamps suggested were in far too many cases both badly spaced and placed. As to Question 10, the answers of a large proportion of students revealed very hazy notions of the temperatures of an ordinary household incandescent mantle; those given ranging from 60° to 4435° Fahr.

It is hoped that the pointing-out of these weaknesses will encourage the students to fuller preparation and such careful study as may lead to more satisfactory results next year.

The questions set in "Gas Engineering" were given in the "Journal" for April 28 (p. 275), and those in "Gas Supply" in the next issue (p. 367). The following is the question referred to by Mr. Glover:

5. Sketch a set of water-cooled condensers, indicating the passage of the gas and water, and showing how the condensates are removed. What points determine the dimensions of the apparatus for removal of the condensates?

The questions specially mentioned by Mr. Hole were:

Grade I.

7. What is the principle of the bunsen burner? Sketch a section through one. What is meant by (1) the primary air supply, (2) the secondary air supply? State how many volumes of each are required for complete combustion of one volume of 15-candle power coal gas.

8. If on attending to a complaint of shortness of gas supply you obtained a pressure chart on the inlet of the meter similar to that shown [May 5, p. 367], how would you then proceed?

Final Examination.

5. You are required to prepare a scheme for heating by means of gas an apartment 30 ft. by 20 ft. by 15 ft. What apparatus would you employ, to what extent, and at what expenditure of 15-candle power coal gas, assuming that the temperature is to be raised from 50° Fahr. to 60° Fahr., and the air in the room is completely renewed three times per hour? Show clearly how you arrive at your conclusions, and upon what data your calculations are based.

6. Calculate and plot [upon the piece of ruled paper given with the questions] the half lower hemispherical polar curve of a high-pressure gas-lamp, fixed at a height of 20 feet from ground level to the centre of the mantle, which is found to give the following illuminating effect at ground level:—

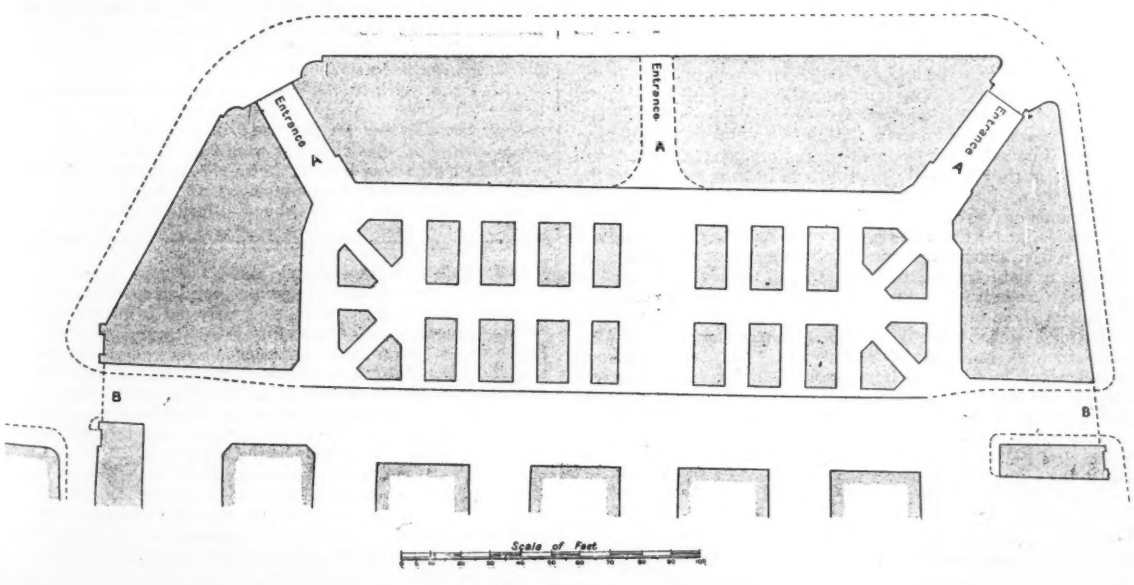
Immediately beneath the lamp	2·0 foot-candles
At 20 feet from a vertical line passing through lamp	1·5 ,, ,,
,, 40 ,, ,, ,, ,, ,, ,, ,,	1·0 ,, ,,
,, 60 ,, ,, ,, ,, ,, ,, ,,	0·5 ,, ,,
,, 80 ,, ,, ,, ,, ,, ,, ,,	0·3 ,, ,,

To complete the curve, assume that the lamp gives 1400-candle power along the horizontal line passing through the centre of the mantles. The above-ground level illuminating effects are presumed to be taken on surfaces perpendicular to the beam.

8. The diagram shows the ground plan of a lofty market hall which you are required to light with gas. The enclosed squares show the comparative size and position of the stalls. Mark on the plan the positions you would choose for the lights. State the type and candle power of the lamp you would use, the gas consumption per lamp per hour, the height at which you would fix them, and the method you would adopt for lighting and extinguishing. The three entrances marked A are for passenger traffic only, while those marked B are for vehicular traffic.

10. What mantle temperatures would you expect to find at the bottom, near the top, and at two intermediate equidistant points of a mantle on a properly adjusted No. 4 "Nico" inverted burner supplied with 15-candle power coal gas?

The names of the successful candidates in both subjects will be found in the "Journal" for July 14 (p. 103); and those of the prize winners on July 28 (p. 212) and Aug. 18 (p. 401).



THE ANALYSIS OF OILS.*

THE third volume (which is bound in two parts) of "Technical Methods of Chemical Analysis," by Professor George Lunge and Dr. C. A. Keane, deals with the analysis of a great variety of materials and products, of which, however, only mineral oils, lubricants, and one inorganic colour—viz., prussian blue—are likely to be of interest to the gas manager or chemist in the exercise of his professional duties.

The section on mineral oils occupies 57 pages; that on lubricants, 47 pages; and the reference to prussian blue, nearly eight pages. Thus out of a total of 1017 pages of text (exclusive of appendix and index), there are only about 112 pages with which readers of the "JOURNAL" will be directly concerned. The range of subjects in the present volume is so wide that very few chemists or analysts are likely to make use of even half of the sections into which the work is divided. The advantage to the practical chemist and analyst of such an encyclopædic text-book is not very obvious. We are convinced he would infinitely prefer that the matter should be distributed in a number of independent text-books, of which he would provide himself with only those pertaining to his own special branches of work. Although the whole collection of such a number of small volumes would be somewhat more costly and more bulky than the congeries of articles forming the present large work, only reference libraries would require the whole collection, and a lot of matter of no direct utility to him would be excluded from the bookshelves of the analyst. As an illustration of our meaning, we may observe that in the present volume, the articles on mineral oils, lubricants, and prussian blue must be of so unique and masterly a character as to be indispensable to the gas manager or chemist if he is to feel himself impelled to expend the price of this volume [viz., three guineas] in order to have ready access to them. Bearing this in mind, we will proceed to indicate the treatment which has been accorded to these subjects by the responsible authors and revisers.

The section on mineral oils was written in the German edition of the work by Professor D. Holde, Ph.D., Divisional Director of the Royal Testing Laboratory, Gross-Lichterfelde, Berlin. The translation in the present English edition has been revised by the late Dr. J. Lewkowitsch, M.A., Ph.D., and the proofs have been read by Mr. J. S. S. Brame. The subject of "Mineral Oils" is dealt with in seven subdivisions—viz., crude petroleum, naphtha, burning oils, paraffin wax, asphalt, shale oil, and lignite tar.

In regard to crude petroleum, it is pointed out that 63·25 per cent. of the world's production during 1912 came from the United States, and only 0·28 per cent. from Germany. Nevertheless, there is perhaps rather more said about the characteristics of the German oil than the American, while very little appears as to the characteristics of the oils from the East, which are now one of the chief sources of the motor spirit which is imported into this country. The fact is that the subject is dealt with according to the limited opportunities which a petroleum expert practising in Germany is likely to have. In that country the native production, which is but a trifling portion of the world's supply, acquires relatively great importance. Practically none of the native German petroleum reaches Great Britain; while other petroleums which are largely imported into Germany also reach us only in small quantities. Thus materials which loom large in the vision of the German petroleum expert have no practical importance at all to the English or the American technical man, for whom the English version of the present work has been prepared. Other crude petroleums which are of great importance to English speaking peoples are by no means adequately dealt with. It is a pity that the English revisers did not see their way to rewrite the greater part of this section from the purview of the English petroleum consultant.

The subdivision on naphtha includes references to motor spirit which for the most part are misleading as to the characteristics of the motor spirits most widely used at the present day in this country. There has been an immense alteration in the fractionation results of commercial motor spirit since 1909, when Mr. Blount published the results of an examination of a number of commercial grades of petrol. These results are, quite properly, quoted in this work; but they certainly should have been supplemented by some more up-to-date information. It is implied that the modern heavier grades of petrol are used only in carburettors in which the exhaust gases jacket the ingoing air. But, as a fact, petrol which would have been considered unusable in 1909 is now freely used in carburettors which have no preheating of the air supply. The analyst who relied for guidance on the information regarding motor spirits given in this work would find himself condemning a large proportion of the motor spirits which are commonly used with satisfactory results at the present time. A so-called "normal benzine" which is prepared by a Berlin firm for asphalt testing is referred to; but this product is scarcely used for the purpose in this country, where the American methods of examination of asphalt are more generally followed. It would have been better if the grade of petroleum spirit, or "benzine" which is used by American authorities on the examination of asphalt, had been specified.

We need make but little comment on the subdivision on burning oil or kerosene. In regard to the photometry of illuminating oils, the reader is told that a bunsen photometer fitted with a Lummer and Brodhun prismatic device is the best to employ. Obviously, this suggestion is that of the German author; and the majority of English photometrists would prefer some other form of photometer head. The subdivision on gas oils from crude petroleum is limited to fourteen lines, four of which are taken up in referring the reader for further information to the section on "Illuminating Gas and Ammonia" in an earlier volume of the work, which has already been noticed in the "JOURNAL" [see Vol. CXVI., p. 524].

The subdivisions on transformer oils and on liquid fuel for internal combustion engines are short; and the latter contains no reference to the excellent series of investigations made by Constam and Schläpfer [see "JOURNAL," Vol. CXXIV., p. 596]. The subdivisions on fuel oils, dust-laying oils, and paraffin wax are also quite brief; but the subdivision on tar and pitch residues is somewhat fuller. The tar and pitch dealt with are those derived from petroleum; and coal tar products are here referred to only as possible adulterants of them.

The subdivision on the products of the shale and lignite industries seems somewhat inadequate; and we do not think the information would in itself enable an analyst to give a trustworthy opinion on the value either of a sample of shale or of crude shale-oil. He would have to go for guidance to the text-books on oils to which references are given in footnotes to this subdivision. Notes on ichthyol and peat tar conclude the section on "mineral oils." As a whole, we think that this section is not worthy of the general scheme of the work or an adequate fulfilment of the aims of the editors. The subject is one on which it was courting failure to seek for the author in Germany. An English or an American expert could have handled it far better; and the translator and reviser does not appear to have thought it worth while to re-write the section entirely, which would have been the only satisfactory way of dealing with it. It is, of course, fair to assume that the section would have been somewhat more up-to-date, but for the unfortunate decease of the reviser, Dr. Lewkowitsch, some fourteen months ago.

The section on "lubricants" is likewise by Professor D. Holde, who, however, has had in it the collaboration of Dr. G. Meyerheim. The late Dr. Lewkowitsch and Mr. J. S. S. Brame are likewise responsible for the revision and proof-reading of this section also. Naturally, lubricants are not so directly interesting to the gas chemist as mineral oils in general; and hence it is unnecessary to review this section in any detail. The German authorship is not perhaps as highly detrimental to this as to the preceding section, since lubricants from most sources are found in use in Germany. It is stated that Germany produces from native material about one-fifth of its consumption of lubricating oils. Lubricants are classified in this work in seven groups: (1) mineral lubricants; (2) fatty oils and liquid waxes; (3) mixtures of fatty oils and mineral oils; (4) lubricating greases; (5) water-soluble oils; (6) thickened oils; (7) non-oleaginous lubricants. Speaking generally, the treatment in this section appears to be far more satisfactory than in the section on mineral oils. We doubt, however, whether any analyst would refer for guidance to this section rather than to one of the standard works on lubricants.

The section on inorganic colours is by Professor A. Eibner, Ph.D., and the English translation has been revised by Mr. H. J. Rawlins and Dr. A. Rule, Lecturer on Inorganic Chemistry at Liverpool University. The portion of this section dealing with prussian blue does not discuss the ultimate sources of the pigment, and therefore contains no reference to the crude gas-works products. So far as the examination of the commercial or purified prussian blues is concerned, the treatment appears to be quite satisfactory; and anyone seeking information thereon cannot do better than refer to this work for it.

This last remark foreshadows our general conclusion in regard to the whole work, which is broadly to the effect that, unfortunately, the sections on mineral oils and lubricants, which are those with which gas chemists would be specially concerned, are not of so high a standard as the rest. As a whole, the remaining sections appear to be well conceived and written; while the type used and the illustrations throughout are excellent.

* "Technical Methods of Chemical Analysis." Edited by George Lunge, Ph.D., Dr. Ing., Emeritus Professor of Technical Chemistry, Federal Polytechnic School, Zürich. English Translation from the latest German edition, adapted to English conditions of manufacture. Edited by Charles Alexander Keane, D.Sc., Ph.D., Principal and Head of the Chemistry Department at the Sir John Cass Technical Institute, London. Volume III., Parts I. and II. London: Gurney and Jackson; 1914.

North British Association of Gas Managers.—We have received from the Secretary and Treasurer of the Association (Mr. P. B. Watson, of Wishaw) the report, reprinted from the "JOURNAL," of the proceedings at the fifty-third annual meeting, held in Glasgow on the 3rd of September, under the presidency of Mr. David Vass, the Gas Engineer to the Perth Corporation. The technical matter is preceded by the Council's report and the accounts, and followed by lists of the office-bearers and members. Portraits are given of the President and Secretary, the readers of papers, and the Young Memorial Lecturer (Dr. Rudolf Lessing); and a reproduction of the photograph of the group of members taken at the meeting serves as a frontispiece. As in previous years, the "Statistical Report of the Gas Supply of Scotland," published by the Council of the Association, is included in the pamphlet. It covers the year to May 15 last.

WORKS TOPICS.

By "Modus Operandi."

Training the Gas Engineer.

All gas engineers cannot fail to be interested in the question of the proper training of young engineers for the profession to which they belong. Mr. Doig Gibb, giving evidence before the Institution of Civil Engineers' Special Committee on the Practical Training of Engineers, outlined the system followed by the South Metropolitan Gas Company; and while, as put by the Chairman of the Committee, it is quite admirable, yet the system was one which, in certain conditions, would very probably fail to give such satisfactory results as are experienced under the private premium-paying system. One can well foresee that in certain companies and corporations, where there is not a sympathetic chief, the young engineering students would be quite neglected. The efficiency of their training would be overlooked; and they would either be left to fend for themselves or be made to make themselves useful in some work which was of little use for their training. Such matters in many cases would be left to the inclination of the shop foreman, who would naturally have no personal interest in the pupils.

In this connection, the writer well remembers his annoyance during his workshop days at being kept for a totally inordinate time on one particular job. The shop foreman, who had just been engaged, found that there were no templates for the various parts required for the machinery in use; and the new foreman conceived the idea of employing the writer to make a whole set of tin templates—a job in which he had (much to his subsequent remorse) shown himself to be particularly proficient. As there were some hundreds of the templates to be very accurately made, the writer was for a long time engaged upon this unprofitable task, to the exclusion of other and more useful work. This instance shows what may happen, and to a much greater degree in cases where the foreman may be imbued with the inclination to make use of, rather than train, the pupil.

The Private Pupil.

In the case of the private premium-paying pupil, he is more likely to be kept at work under the eye of the chief, who is directly responsible for his training, and who, should he be a man of honour, feels in duty-bound to give the pupil his money's worth. Many chiefs, to their credit, take a great deal of pains over their pupils' training, and on the termination of their indentures do their utmost to place them in a junior assistant's position in a suitable gas-works. Having done so, it may justly be said that in the majority of cases the pupil has been given every opportunity of starting a successful career. The writer would, in his humble opinion, always much prefer to be apprenticed to an individual rather than to a company or corporation.

Company's Pupil.

In November of last year, Mr. Milne Watson read a paper, in which he outlined the educational scheme adopted by the Gas Light and Coke Company. Under this scheme, the young gas engineer undoubtedly receives a very comprehensive training; and those who are interested in this important subject could not do better than refer to the paper. In this column the system of training was summarized in the "Journal" [Nov. 11, 1913, p. 496]; and it is seen that in some respects it is not unlike that referred to by Mr. Doig Gibb as being the practice of the South Metropolitan Gas Company.

The mere fact that two companies of this magnitude and reputation should have adopted a scheme whereby pupils are apprenticed (without premiums) to a company, rather than to an individual, is substantial evidence in support of the opposite point of view. It is, however, a case in which the exception proves the rule; and such a system, properly supervised, is undoubtedly capable of turning-out thoroughly good men. But in the wrong hands, it is open to a great deal of abuse.

Period of Training.

In the training of a gas-engineer during a course of three years, the actual apportioning of his time cannot, of course, be absolutely defined; and on this point most authorities are agreed. Three years is so short a time that too much must not be expected of the young engineer on the expiration of his pupilage. If it can be arranged for him to spend a year in the workshops, a year in the drawing office (which should include the laying-out and superintending of actual work), and a year on the district, then it may be considered that the maximum possible opportunity has been given him of obtaining an all-round knowledge of gas engineering. After the subsequent two or three years as a junior assistant, when the daily routine of the retort-house and the handling of materials, purification, and testing, and the management of men take their place in his work, then only can it be said that his training is approaching completion. It must not be expected that his time should have been exactly apportioned between all the manifold duties of a gas engineer with so many months to each; for this scheme of training would be on wrong principles, and would tend to make him "a jack-of-all-trades and master of none." Better far to give him a good grounding in the main features, and he will then be the better equipped for taking a firm grasp of any particular branch of the work should he be required to specialize, as is always the case, in the larger undertakings. In the smaller concerns, there is no question of specializing; for no particular work is sufficiently important to warrant it. But it is a moot point as to which experience is the more valuable to a man destined to control an undertaking of importance.

The period of pupilage and the subsequent four or five years should at least include the regular attendance of evening classes in all the subjects which are of most use to the gas engineer. Neglect at this stage in a man's training can never be repaired. The holding of first-class "Honours" certificates in both "Gas Engineering" and "Gas Supply" should be considered an essential qualification; while if to this can be added success in the Institution of Civil Engineers examinations, it may be considered that everything possible has been done in the direction of theoretical training.

COAL AND COKE SUPPLIES IN GERMANY.

The figures given in last week's "Journal" [p. 409] for the coal production in September in certain districts of Germany, can now be supplemented by figures of the total output throughout the German Empire. The month's production of coal was 9,995,385 metric tons, which is 63 per cent. of the production in September, 1913. The brown coal production amounted to about 80 per cent. of that for September last year. The coke production was 1,645,488 metric tons, compared with 2,677,599 metric tons in September, 1913.

Both in Upper Silesia and Westphalia an improvement in the output and deliveries of coal in the latter half of October was reported by the "Journal für Gasbeleuchtung." Oven coke had been receiving further market support; the Prussian Government having bought for November a further 100,000 tons of blast-furnace coke—chiefly for use as locomotive fuel—at the price of 13s. 6d. per metric ton at the ovens. In gas-coke, good business was being done in the East and in South Germany, and in export to Holland and Switzerland. But in many districts, including Greater Berlin, stocks were increasing. It was hoped that "interference with neutral shipping caused by English mines in the North Sea may result in larger quantities of coke being exported from Germany to Denmark, Sweden, and Norway, *viâ* Lübeck and Warnemünde."

GAUGING OF GASHOLDER SHEETS AND PLATES.

The Institution of Gas Engineers and the Society of British Gas Industries have agreed to add the following new clause to the Standard Clauses of Contract—to be numbered XXX.

XXX.—Gauging of Gasholder Sheets and Plates.

That the recommendations of the Engineering Standards Committee be recognized.

That the standard wire gauge be employed (S.W.G.).

With regard to sheets ¼-inch thick and under, where a thickness or weight is specified, there shall be a rolling margin in the thickness or weight of 5 per cent. under and over.

With regard to plates and sections over ¼-inch thick, the recommendations of the Engineering Standards Committee shall apply.

That engineers who provide quantities shall make the aforementioned allowances of 5 per cent. on sheets and 2½ per cent. on plates in all cases where they require sheets or plates to gauge the full thickness on the longitudinal edge.

London and Southern District Junior Association.—Next Saturday afternoon members will pay a visit to the Wapping works of the Commercial Gas Company, where there are a number of things to be seen that will much interest them. On the following Friday, at the Westminster Technical Institute, Mr. T. F. C. Potterton will read a paper entitled "Gas-Heated Hot-Water Supply Apparatus." The Council have elected Mr. E. G. Stewart, of the Gas Light and Coke Company, as Junior Vice President; and Mr. S. B. Chandler, of the South Suburban Gas Company, becomes Senior Vice-President, in place of Mr. Ernest Scears, who has gone to Rugby.

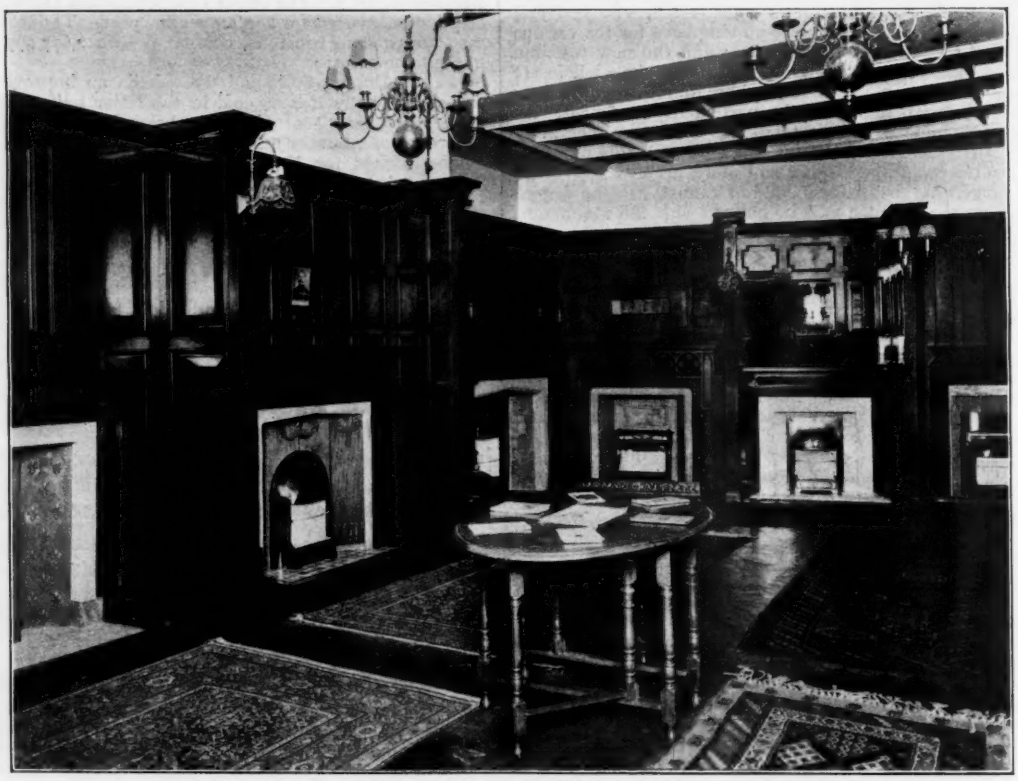
Gas-Works Directory and Statistics for 1914-15.—Acknowledgment has to be made of the receipt from the publishers, Messrs. Hazell, Watson, and Viney, Limited, of No. 52, Long Acre, W.C., of a copy of the "Gas-Works Directory and Statistics for 1914-15." One notices that from year to year the number of pages increases; and the fact that the book has reached its thirty-seventh issue is sufficient testimony to its usefulness. The price is, asusual, 10s. 6d. net; and the alphabetical index of chief gas-works officials and the list of Associations of Gas Engineers and Managers are again included. A great deal of information is given with regard to the different gas undertakings; and every effort has been made to ensure its being up-to-date. It is a big task; and the Editor acknowledges his indebtedness to the engineers, managers, and secretaries of gas undertakings who assist in carrying it out.

A PERMANENT EXHIBITION OF GAS APPLIANCES

At the Davis Gas-Stove Company's New Show-Rooms.

"Our show-rooms represent a permanent exhibition of appliances for domestic economy, including lighting, heating, cooking, and hot-water circulation, of the latest and most efficient types." This statement, which catches the eye on pausing to glance at the well-arranged windows of No. 60, Oxford Street, W., is one which is tolerably certain, if the reader be of the fair sex, to give rise to a feeling of curiosity, or, if not of the fair sex, to create a desire for further information. Whichever way it may be, and whatever may be the precise difference between the two propelling forces, the result in both cases is likely to be the same—a closer inspection. This is just what is wished for by the Davis Gas-Stove Company, Limited, who are in possession of the premises; for it is, of course, useless to prepare a feast unless the guests come along to partake of the fare. And that a very sumptuous feast has been prepared, the following particulars and illustrations should go some way to prove.

If the intention in the display in one of London's main shopping thoroughfares of the words just quoted is to invite a closer inspection, precisely the same reason may be urged for reproducing them here. The main object in penning this article will have been achieved if it results in the forming of a fixed resolve by readers to make a call, when next they are in town, at No. 60, Oxford Street. Should they make such a resolve, and carry it into effect, they will feel grateful to the "Journal" for having put them in the way of a "good thing," and doubly so to the Davis Gas-Stove Company, Limited, for having provided this same "good thing." For the Davis Company have gone far in a particular direction beyond anything of the kind one remembers to have seen before. A bold scheme was formulated (there is small fear of mistake in saying that it originated in the fertile brain of the Managing-Director, Mr. Cyril G. Davis), requiring for its successful working out a very large amount of artistic skill and a heavy outlay of hard cash. Well, the idea has become a reality; and nowhere is the faintest sign to be discerned of there having been any stint whatever in regard to either of the essentials named. Right through, from beginning to end, it is obvious that the object aimed at, and the result attained, has been the securing of "the best." In fact, nothing less would have served the purpose in view. It has been said that the main object in writing this article is to persuade readers to go and "see for themselves." That is the case. There is, however, at the same time another object, which is to make generous acknowledgment of the good work the firm are doing for the industry at large.



A FEW OF THE FIRES IN THEIR HANDSOME SETTINGS.

An Appeal to the Architect and the Consumer.

In making this remark, there is no intention of in any way asserting—what, indeed, they themselves would be the first to deny—that the Davis Gas-Stove Company have been actuated by philanthropic motives. Sound commercial businesses are not built-up on these lines. But what they have done is to take a very broad-minded view of the situation. By showing, as they do, what gas is like under ideal conditions, for lighting, heating, and cooking, they are directly helping the gas industry and indirectly assisting themselves; while by displaying their stoves in the same manner they are directly helping themselves and indirectly assisting the gas industry. What has been done, in short, has been to fit up a permanent gas exhibition, so designed in every respect as to put gas on the highest plane and be of the utmost possible educational value, and thus be worthy of a very great industry and of a very enterprising firm. The consumer whose domestic gas appliances may not be all that could be desired in the matter of efficiency will, on spending half-an-hour in these Davis show-rooms, have his eyes opened considerably; the non-consumer will find gas capable of things that were hitherto undreamt of in his philosophy (else he would not have so long remained a non-consumer); while the architect will never again be able to think of gas as being unsuitable to fit in with even the richest schemes of decoration.

To the architect gas undertakings are specially anxious to appeal; and too often, of course, considerations of space, if nothing else, make it difficult to attract him to ordinary gas exhibitions and show-rooms—greatly as these have been improved during recent years. He will, however, find a visit to the West-end premises of the Davis Company both pleasant and instructive, even if in going he has had no thought of gas. There is much to professionally interest him outside the direct application of light and heat; while if he is desirous of inquiring into matters relating to either or both these problems, there is every facility at hand to enable him to do so. The opportunity is one which architects are already availing themselves of in substantial numbers. Two or three came in during the short time the writer spent there one afternoon last week; and this he was assured was a daily occurrence. Knotty points can be unravelled in ease and quietness, in an elegantly appointed reception-room, provided with such aids to business as

THE RIGHT-HAND SIDE—THE LIFT AND RECEPTION-ROOM.

writing materials and a telephone; while if there should be such scepticism as cannot be removed by the sound arguments of the expert staff in attendance, optical demonstrations will be given, by means of the "Shadowgraph" or some other special test, in the dark room which is being fitted up for the purpose. The fires to be seen are all on an absolutely hygienic basis; and the fullest inquiry is courted.

What is being Done.

The idea of this permanent display really originated at the time of the National Gas Exhibition at Shepherd's Bush—the educational value of which was fully appreciated by the Davis Gas-Stove Company—and in more than one respect it is on somewhat similar lines. An inquirer who comes along and takes a fancy to a special pattern of fire, cooker, or water-heater, is asked what district he or she resides in, and is told, "This apparatus can be hired or bought from your Company." The undertaking are then advised to follow up the inquiry. On the other hand, it is desired that gas companies should send on their consumers to these showrooms to make selections of fires, &c.

As to the lighting department, almost every good type of gas-fitting is shown under the best conditions; and everything has been bought outright. In the selection, price has not been considered, but only quality and design. Though orders are booked

A VIEW OF THE LEFT-HAND SIDE ON ENTERING.

for gas-fittings, the Davis Company are not doing business direct, but through the various companies.

A Glance at What is to be Seen.

There is not space at disposal here to describe all that is to be seen and do full justice to the show-rooms; but the accompanying photographs will convey a better impression than words could do of what they are like, although it would require fully four times the number to give anything approaching a complete view of the place.

Leading up to the massive front doors, and thus quite open to the passer-by without even the formality of entering the show-room is an arcade, with plenty of room on either side for the adequate display, against a choice background, of modern gas apparatus of all kinds. The contents of these windows are frequently changed. Last week there happened to be in position a striking exhibit in the shape of a gas bath room, consisting of a luxurious shower-bath and basin, with various patterns of gas-heated water-circulators, and a radiator. There were also selected specimens of gas-fires, cookers, &c.

Passing through the doors into the spacious ground-floor room—it is in reality much more than a room, though no more suitable word can be found to describe it—one is confronted with dozens of splendid examples of the wood-workers' art in oak and mahogany. Everywhere is panelling, &c., to suit the most fastidious taste. Each fire—and there are many of them, of handsome design and finish—is in a setting of the utmost refinement; and the result is convincing testimony to the perfect manner in which the modern gas-fire blends with an artistic scheme of decoration. The mantel-surrounds are in keeping with the different designs in panelling, &c.—Elizabethan, Jacobean, Georgian, and other styles—and many of them are reproductions of celebrated old mantelpieces. One striking example noted was a reproduction of a Georgian mantelpiece in the Victoria and Albert Museum. These surrounds, it should be mentioned, are made by the Nautilus Fire Company, Limited, whose business is owned by the Davis Gas-Stove Company. One very effective piece of work to be seen on the right-hand side on entering is a little ingle-nook, with radiator, fire, and handsome marble surround, with full particulars of prices exhibited in a neat frame. Then there are the very many "live" gas pendants and brackets (fitted with Telephos lighters) of a character to match the furnishing and fitting-up. As has been said, everything is of the best; and no higher praise than this can be accorded. Just as an instance of the way in which the scheme has been carried out, it may be stated that on the polished floor there are a number of exquisite Persian mats, to the value of many hundreds of pounds.

From the ground floor, a lift takes the visitor to the basement, where both sides of a space of some 90 yards are lined with apparatus of various kinds. Facing the exit from the lift, there is in course of construction a hotel kitchen, with tiled walls and black-and-white flooring, where will be shown appliances suitable for employment in such a place. In one part of the basement there is a large coal-range, and adjoining it a system of gas-heated water supply, showing all the pipes and connections. Next are a coke-boiler, also with all pipes and connections, and a combination coal and gas range. Near-by are three other coal-ranges, each one fitted with a different type of gas-boiler—again showing connections and piping. And for those desiring to make a closer study of the matter than such outside inspection affords, there will be exhibited sectional drawings of every type of boiler made by the firm. Another section is devoted to large cooking apparatus, and photographs of big installations carried out by the Davis Company; and then there is reached a complete kitchen installation for ordinary domestic purposes, comprising cooker with hood, a circulating boiler for supplying hot water all over the house, a wash-boiler, for washing-up, &c., and a radiator for heating the kitchen, so that there is no need for the use of coal at all. This is followed by a vitreous tiled bathroom, with ordinary and shower bath, and lavatory basin; and close by are a complete range of geysers connected with baths, and a number of different schemes of tiling for bathrooms.

Then in a straight run are endless further samples of fitted gas-fires, many with different patterns of tiles, and others again with rush-matting backgrounds. There is also another strong array of gas-pendants and brackets, arranged to be shown in action. In this part of the premises, also, is situated the dark room which will be used for testing purposes.

THE MANAGING-DIRECTOR'S PRIVATE OFFICE.

The skill of the architect has not been confined solely to the show-rooms proper. Mr. Cyril Davis's private office, on the ground floor (which forms the subject of one of the photographs), is a veritable "study in light oak," from the point of view both of the design and the workmanship. There is also close at hand a suite of excellently appointed offices where the Company's selling staff are to be found—the Secretary's and Accountant's departments remaining at Camberwell. This portion of the premises abuts on Rathbone Place, where there are two windows available for the display of goods.

In closing this article, the hope may be expressed that enough has been said to induce all who may read it to take the earliest opportunity of inspecting for themselves this unique permanent exhibition of domestic gas appliances by the Davis Gas-Stove Company, Limited.

Professor C. Vernon Boys, F.R.S., one of the Metropolitan Gas Referees, will deliver the eighty-ninth Christmas course of Juvenile Lectures founded at the Royal Institution by Michael Faraday. The subject will be "Science in the Home;" and the lectures will be experimentally illustrated. They will commence at three o'clock, and the last three (to be delivered on Jan. 5, 7, and 9, 1915) will be on heat, electricity, and light in the home.

THE "SECOND MILE" IN SALESMANSHIP.

By W. M. Mason, Secretary of the British Commercial Gas Association.

[Address delivered to the London and Southern Junior Gas Association, Nov. 27.]

Your Secretary suggested that I might say something to you this evening on the subject of "Salesmanship"—a subject in which every one of us should be interested, as, whether or not we realize it, we are all, in whatever capacity we may be employed in our respective undertakings, salesmen.

The recognition which the uniting power called "co-partnership" has secured in modern thought and practice, makes it a comparatively easy matter to demonstrate the importance of every individual unit in an organization putting his best into his work if the highest possible results are to be achieved.

Some men in our industry think that the most effective factor in salesmanship is "cheap gas"—so effective that all others may be ignored. While not for one moment decrying the value and power of a low price, I believe most emphatically that good service and moderate price will gain more business than low price and poor service—the best results, of course, coming from good service and low price. I merely state the point without stopping to debate it, as the acknowledged fact that the selling price of the product affects, in any measure, the business, brings at once within the category of salesmen every member of the concern from the general manager to the humblest employee on the pay sheet. Indeed, the truth of the statement that no chain of business organization is stronger than its weakest link, is being more and more clearly recognized, as the science of salesmanship is receiving the increasing attention it demands and deserves.

As proving the importance of general efficiency, and as an illustration of how a highly-paid salesman's work may be nullified by an inefficient junior, I give you the following incident recently related at an American Gas Association meeting:

In a Missouri town one night, I was talking along this line; and the Secretary of the Y.M.C.A. came to me and said: "Mr. Tolles, I would like to have you come over to my office." I told him if I had time I would be glad to do so. The next morning I walked into his office, and he took out of his pocket an envelope and laid it down and said: "You know we are about to re-furnish this building. There is a big amount of money to be spent in furniture. We have been negotiating with a number of concerns, and I had practically made up my mind that we would utilize the product of a St. Louis firm. But when I got this letter I hesitated; and I didn't know until I heard you talk last night what it was that made me hesitate." He took out the letter, which was businesslike; the letterhead was all right; but it had been folded in a very irregular way and slapped in the envelope. He said: "I see that if this firm is careless about their transactions with me before they get my business, what will they do after they get it? I can expect that the goods may be shipped incorrectly, that they may be poorly packed, and that there may be one after another dissatisfaction." The whole transaction rested upon the folding of that letter, and that firm to-day has never enjoyed that Y.M.C.A.'s patronage. Now these are little things; but I maintain that we are judged more by the little things than by the big things in business.

So thoroughly am I convinced of the importance of each individual employee being inspired with the feeling that he is an essential and necessary part of the business machinery, that I purpose to devote the greater portion of the time at my disposal this evening to an endeavour to rouse your individual interest and ambition. We can best further our own interests and serve our respective undertakings, by seeking to perfect our individual service.

A staff, like a community, is composed of various units, and by improving any of the units the whole automatically benefits. I feel certain that if I really succeed in my endeavour, I shall have done something for which you will be very grateful in the future, and something which will make the department with which you are connected more efficient as a business-getting organization.

The Second Mile.

A well-known Scotch cleric has, in an excellent discourse on the scripture, "Whosoever shall compel thee to go a mile, go with him twain," defined what he terms "the doctrine of the second mile." I have no intention, even if I had the ability, of inflicting a sermon on you this evening; but I wish to make a paragraph from the Glasgow parson's discourse a peg on which to hang some thoughts which will, I trust, prove not unprofitable to you. My quotation is this:

In all life there is a certain distance we must go. In every activity and energy of man there is a certain limit we must reach to live. By the structure of our bodies, by the laws of Nature, by the demands of business, by the call of duty, by the requirements of society and of our souls, we are compelled—so far. But liberty and joy and real life begin when, beyond that, we go a little farther. In other words, there are certain demands made upon us. No man escapes them, not even the humblest or poorest. Up to a certain point we must obey; we have no choice; it is a universal law. Beyond that, life commences; true life, with the breath of liberty upon it. And that is the sweet doctrine of the second mile.

The preacher elaborates his theory by some excellent illustrations. For instance:

We were all compelled to go the mile in school days. There were certain lessons that we had to learn; we had to master them whether we would or no, and I never met any boys who really enjoyed that taskwork, except the objectionable boys in story books. The pity is so many go the mile, and have never the heart to go a little farther. For beyond it is all the world of literature, and all the fascinating tale of science, such a feast for intellect, imagination, reason, that we thank God that we were ever born. That is the second mile, intellectually; and no school-board can compel anyone to tread it. Yet it is there that the real joy of having learned begins to flow like a tide within the soul.

I shall endeavour to emphasize, as I am able, the bearing of this "Second Mile Doctrine" on the subject we have chosen for discussion. I take it that we, as members of a Junior Association, are eager to discover the golden key which will open the door of a successful business career; that we, in the attitude of students, are keen on information or the elucidation of facts which will prove useful in the future.

"What do you mean by success," some of you may ask. Ruskin has a telling paragraph which is aptly suggestive:

It happens, he writes in "Sesame and Lilies," that I have practically some connection with schools for different classes of youth; and I receive many letters from parents respecting the education of their children. In the mass of these latters I am always struck by the precedence which the idea of a "position in life" takes above all other thoughts in the parents'—more especially in the mothers'—minds. "The education befitting such and such a station in life"—this is the phrase, this the object, always. They never seek, as far as I can make out, an education good in itself; even the conception of abstract rightness in training rarely seems reached by the writers. But an education, "which shall keep a good coat on my son's back, which shall enable him to ring with confidence the visitors' bell at double-belled doors, which shall result ultimately in the establishment of a double-belled door to his own house—in a word, which shall lead to advancement in life—this we pray for on bent knees, and this is all we pray for." It never seems to occur to the parents that there may be an education which, in itself, is advancement in life; that any other than that may perhaps be advancement in death; and that this essential education might be more easily got, or given, than they fancy, if they set about it in the right way, while it is for no price, and by no favour, to be got, if they set about it in the wrong.

The philosopher's conclusion was, of course, that the only truly cultured man was the "advanced man." You are, I am sure, at one with me in thinking that the really successful person is not he who has by foul means (even if labelled by a fair name), by pandering to the vices of the people, by absorbing the brain power of his hirelings without acknowledgment, by successful gambling on the Stock Exchange or the Race Course, or in such other manner, built up for himself a big bank account and a flashy establishment.

True Success.

True success lies more inside than outside a man, and reveals itself in growth of mind, wider resources for usefulness, broad outlook and extended horizon, greater consideration for the feelings and aspirations, the faults and failings of other people; an ever-increasing lifting power for the individuals and the community about him.

The man who develops along these lines, even if he is never recognized or recompensed at his real worth, is the truly successful man, because he has succeeded in building the only thing that moth and rust have no power to consume—"Character." And from even the lowest standpoint of material gain, it has been well said that, "as a mere question of getting on in the world, character and steadiness will do more for a man than cleverness."

Man's strength lies in his mind rather than in his muscle. The day of physical force has passed, and now, while much depends upon a sound body and good health, it is more than ever true that

> "Were I as tall as reach the pole,
> Or grasp the ocean in a span,
> I must be measured by my soul;
> The mind's the standard of the man."

Real and lasting success in business to-day is based upon quality of mind and proper training.

I am perfectly well aware that mental capacity and business training are two distinct qualifications. The plain fact is obvious, however, that many a man with splendid natural capabilities, through lack of proper training—in other words, through inefficiency—has to be content with a back seat, or no seat at all, while he sees men go past him who started with fewer natural resources, but who, sharpened in the school of experience, disciplined in mind, and with faculties trained and controlled, have fitted themselves for positions of responsibility and power. That poets are born not made, while business men are made not born, is true in most cases. I say "most cases" because, of course, we all know of big business men of whom it is truly said, "they were born to command; they were made to order."

Do not for a moment think that I am here referring to failures in the usual sense. I take it that none of us could fairly be put in that classification, except perhaps in Russell Lowell's thought of "low aim" being crime.

The Drones.

We prefer not to think of these incompetents, or, as they might be termed, "Half-Milers"—those who, generally from rank laziness, never have done, and never will do, their bit, and who are a drag on business ideals as on Society. They are to be found at both ends of the ladder, in directors' chairs and in high office, where they have been pitchforked by relatives or influence, as well as "resting" in our parks—a blot on a fair scene, a disgrace

to our boasted civilization. Most gas companies would gladly sell you some of the breed—men who like work so well that they can sleep beside it, drones in the bee-hive of industry, living on the workers. Like the poor, they will always be with us—not confined to any one class or creed or colour, but found, without much searching, in every business under heaven. To the same type, though perhaps of a milder form of the malady, the cynic says: "You should be careful, you know; you might get interested in your work, and let your pipe go out." It is better to smile at than emulate that brilliant philosopher and splendid writer, but wretched business man—Charles Lamb—who went away early at night to make up for being late in the morning.

We have, I am sure, little sympathy with that lot. But does not the real danger for us just lie in this fact—that we are quite equal to our duties, that they do not "stretch us," that they, through practice, have become mechanical? Or, it may be, we hearken to the evil spirit which whispers, "You do as much as you are paid for; you may work yourself to death and never be thanked for it; you are doing somebody else's work, and he's reaping the reward." Such suggestions are far from the teaching of the "Second Mile." May I suggest some antidotes for such a devil's doctrine, which will surely wreck the career of the fool who listens to it. Here are three simple recipes:

"Folks who never do any more than they are paid for never get paid for any more than they do."
"Beware of the easy job."
"Sit still and your promotion will generally sit still with you."

Real Danger.

The danger, I repeat, is that the majority of us do not see the necessity of entering on the "Second Mile"—of equipping ourselves for it by mental training and active stretching-out to higher ideals, or by fitting ourselves for what may, at the present time, seem the impossible post, the forlorn hope, the "too good to be true."

The following incidents illustrate what I mean, and will, I feel sure, impress you, as they impressed me, with the thought of the opportunities which have been thrust upon us for improving the faculties we possess, but which have been thoughtlessly or deliberately neglected. These illustrations are from a recent issue of the "American Commercial Gas Association Bulletin."

(1) An engineer, with 125 engineers under him, set out the other day to find a man who had a knowledge of engineering cost-accounting. Somebody said, 'You've got 125 men under you, don't any of them know it'? He said, 'Not one.' Every one of those 125 engineers had a chance to double his pay, had he known cost-accounting. Ask any one of the engineers why he did not study cost-accounting, and he would reply: 'Well, there was no reason why I should have learned it.' As a matter of fact, there was no reason, if he did not want to get any further. And so long as he did not bother about preparing himself for an opportunity to double his salary, the opportunity did not bother about him when it came along.

(2) The assistant cashier in a bank left to take a position with a larger bank in a neighbouring town. Six months later a man with a proposition for assistant cashiers called, and finding that the man he had known was gone, he asked to see his successor. He was told that none had been appointed. He later found out that, although there were twelve clerks in the institution, none of them knew enough to be appointed assistant cashier. Even the paying teller was not competent to take the position. He was a first-class paying teller, knew the depositors well, recognized their signatures, and was familiar in a general way with customers' accounts. He counted money quickly, operated an adding machine, and got his statements out on time. However, he knew little of the conditions underlying the making of loans; he did not know enough about accounting to analyze financial statements; he did not understand securities and investments, and the factors that affected their valuation. The directors of the bank were loth to bring in a new man, and yet none of the men in their employ had fitted himself to take the position. There was an opportunity, and yet no opportunity, because none of the men had done more than master the work that was, at the time, demanded of him.

(3) The chief engineer of one of the largest mining corporations in the world lately returned from South Africa. He had been making a valuation of certain mines, whose operation had just been taken over by his company. He was eloquent on the opportunities for men in this new field, and expressed his regret that he did not know a single engineer under him who knew enough of accounting, finance, and business management to supervise some of this work. The company pays unusually high salaries, and the average ability of its men is high. Yet few of them have had the vision and farsightedness to see that opportunities like this are always just over the horizon for the man who can grasp them.

(4) A man approached a superintendent of a department of a public service corporation, asking him, since his work and training were entirely technical, to take up a course of reading that would give him additional knowledge on other departments of business. The superintendent refused. Four weeks later—only four weeks, remember—the same man dropped in on the same superintendent, and to his surprise found the latter ready to listen to him. The caller could not understand the reason. Towards the end of the conversation, however, the superintendent showed him a letter offering him the management of a big company in another state. He was compelled to refuse the opportunity on account of his lack of knowledge of financial and general commercial matters. "Get out your blank and enrol me," he said. "One bitter lesson like this is enough."

The Thousand-a-Year Man.

The truism that there is plenty of room at the top does not come home to us until perhaps, like the superintendent, in our own experience we are faced with a big position which we might have successfully tackled if we had only trained ourselves for it. A paragraph in a recent issue of that inspiring little publication, "The Organiser," headed, "Cannot find Thousand-a-year Men," gives the report of an interview with one of the chiefs of Whiteleys, during which he made several rather startling statements. Here is one of them:

> It is extraordinarily difficult to find men suited to the highest posts in a big house—to find (say) the thousand-a year man. No doubt other heads of large businesses have told you the same thing. Yet I personally am not looking for superhuman abilities—merely sane business judgment, thorough knowledge of goods, and a capacity for keen, well-directed thought. Men who measure-up to these requirements are decidedly rare.

But some of you may say: "Oh these are all cases outside of our line; there are no such plums to be picked up in the gas industry." Are you sure? It is not so many months since I had an interesting conversation on this very subject with one of the most influential men, as regards selections for big positions, in the industry. He told me that shortly before our talk he had been asked to nominate men for three important, high-salaried posts, all with excellent future possibilities. The men wanted were not engineers only, but men with some practical knowledge, *plus* business ability, initiative, and push. Though the gentleman referred to knows more individual gas men than perhaps any other one connected with the industry, he told me that he had great difficulty in finding six names that he could, with any confidence, recommend.

It seems to me that there is much cause for thought in such a statement; but is there not also a tremendous incentive for progressive juniors to fit themselves, not only for doing efficiently the immediate work for which they are responsible, but for the big post which will come along probably sooner than they imagine? And it is just here that the principle and the lure of the "Second Mile" works with unfailing effect.

Future Leaders.

I make bold to assert that the men required at the top to-day (and a lot more of them will be required in the days not far ahead) are not only men who are experts in their own particular section, but who, profiting by experience, or by educational culture (not the German kind), have broadened and developed their minds so that they are able to grasp general business principles—men who have enlightened vision for the possibilities of further developments along, it may be, new and untried lines. The successful manager of the future will be the man who is not merely content with getting his production or manufacturing costs right, but who will be capable of tuning-up the public service side of his concern and developing the business-getting organization.

In a word, he will require to see that the art of selling is as near (and it is as capable of) perfection, as the science of engineering or chemistry. No narrow-minded man of mean policy will be fit for such work. The pompous type of manager, inflated with his authority and position, and devoting his time to advertising his own importance (which is not worth advertising) will also one day be a thing to be smiled at, but never to be taken seriously.

But how does this affect you? You are an engineer or a chemist, an accountant or a secretary, a fitter or a meter inspector, or a clerk, a show-room man, or an office hand. You know your work well, you do it conscientiously; your chief can rely on you. Good! You are to be commended; you rank with credit as a man compelled to go the mile, who, without whining, nay with steady cheerfulness, goes every step of the way. But, as our preacher pointed out, not only the joy of life, but the true success, inward at least if not always outward, is in treading that "Second Mile" of steadfast endeavour, in training oneself in thought and work ahead of what is actually required. It is by thus gathering information and developing your faculties for bigger things, that, in the best sense of the term, you will soon be too big for your job and have to get "a size larger." The value of evening school work only needs to be suggested as one of the finest aids for "rounding off" and "rubbing up" one's knowledge in particular directions.

The Extra Bit.

At present you may be supreme at your individual work, but you require general knowledge about the other departments of the business. If you have mastered your particular departmental problems, you must have extra knowledge with which to handle greater ones. Information and training are necessary to enable you to do more and better work.

It is encouraging to the "pusher" to remember how other men have risen from the ranks. The general manager's pen is as truly on every junior's desk as the marshal's bâton is in the soldier's knapsack. The youth of to-day is not asked who his ancestors were—though good blood tells. "What can you do?" is now the test.

My grandfather was manager to a man named William Dunn, who, although of very humble parents, by pluck and business ability built up a large local industry in cotton spinning. I have frequently heard it told that at a public meeting Mr. Dunn was advocating some course of procedure which was strongly resented by one of the county magnates, who, in a rage, said: "Why, your father was only a blacksmith." "Yes," retorted the

other, "he was, and if your father had been a blacksmith you would have been one too."

EXAMPLE.

Do we not remember with pride that some of the men who have done most for the gas industry have been men born not with silver spoons in their mouths, but with determination in their hearts to make the most of their opportunities. Such names as William Murdoch, George Livesey, Thomas Newbigging, Corbet Woodall, will always have honoured places in the annals of the industry.

I frankly confess that when I was thinking out this address, there was a man before my mind's eye who is, so far as my knowledge goes, the best living personification of this "Second Mile" theory. One who is at once an inspiration and an example; a leader, an optimist, with a wonderful capacity for hard work. I mean, of course, the man that I honour as Chief, who has been rightly named the "Master Mind" of the Association which I have the honour to serve.

The only man who can keep you from "making good" is yourself. Be a marked man by becoming indispensable, by so doing your bit that, when any difficulty arises in your department, your chief will instinctively think that you are the best one to straighten it out. A couple of visitors from the country, in the Strangers' Gallery in the House, tried to recognize their member on the floor. "I can't distinguish him," said one hopelessly. "Of course not," was the honest reply, "he can't distinguish himself." Is there anything about our work or ways to distinguish us?

I hope you do not think that I am playing the old game of passing on cheap advice that costs little and impresses less. I can assure you that I am trying to address the principles advocated as much to myself as to any of you. The elements which go to the making up of the "Second Mile" doctrine should be interesting, as they must surely, at the same time, indicate the true stages on the road to success.

PERSONALITY.

Probably if some of you gentlemen who have been through a course of lessons on "Salesmanship" were asked to name the first essential, you would say "judgment." I well remember hearing that remarkable teacher, Mr. Sheldon, say that even if a man had no arms and no legs, but had perfect judgment, he would be an invaluable asset to any business. That may be perfectly true; but I venture to suggest something which will help a young man even more, especially at first, as he may have very limited scope for the exercise of judgment, good or bad. I refer to individuality or personality, or whatever name you care to give to that elusive quality which raises a man above the crowd, which stamps him as one possessing what we term "a mind of his own;" one with the courage of his convictions, who is neither unwilling nor afraid to give a reason for the faith that is in him.

Probably some of you noticed "Punch's" recent joke about the recruit who was anxious to get to the front, and was determined to accommodate himself to any condition that might arise. When the recruiting officer asked about his religion, he promptly replied, "Well, what are you short of?" This is doubtless a good spirit, so far as adaptability is concerned; but the man who trims his sails to every breeze will have difficulty in getting safe home to the port of success. Someone has truly said: "There is one sort of man for whom there is no place in the universe, and that is the wobbler—the man on the fence, who never knows where he stands, who is always slipping about, dreaming, apologizing, never daring to take a firm stand on anything. Everybody despises him. He is a weakling. Better a thousand times have the reputation of being eccentric, peculiar, even cranky, than never to stand for anything."

This is surely an age when the tendency is too much to let the leaders do the thinking; when the crowd, even more readily than in the days of old, will one day cry "Hosanna" and the next day "Crucify;" when most young men are apparently content to swim with the tide, to vote with the majority, to ape the mannerisms of the big men rather than strenuously endeavour to develop their own growth. You will never get the crowd on the "Second Mile." If you decide to travel on that way you must make up your mind to "gang yer ain gait," as we say in Scotland, which, being interpreted, means go your own way, at your own pace.

"By thine own soul's law learn to live;
And if men thwart thee take no heed,
And if men hate thee have no care;
But sing thy song and do thy deed,
And hope thy hope, and pray thy prayer."

HARD WORK.

The second essential for the successful salesman is such an old recipe that I am almost ashamed to repeat it. It is nothing more or less than hard work. Work will get us to the first milestone; hard work will have to be our faithful guide to the second.

T. P. O'Connor, in a clever character sketch published in "Pearson's Magazine" for October, has this pregnant paragraph:

If I look for the roots of Lord Kitchener's greatness, I trace them to intense ambition to succeed, to make the most of his opportunities; above all, to the intense desire to work and fill every hour of his days with something done.

Nelson once said: "I owe all my success in life to having been always a quarter of an hour before my time." If the power to do hard work is not talent, it is the best possible substitute for it. But, you assert, many a poor soul has to work harder than any of us, and in spite of it all, never gets out of the rut. This is a truth which cannot be gainsaid. A wise man has, however, suggested a probable reason, which is this:

There is a fundamental principle underlying all progress, and that is that it depends upon effort, but well-directed effort.

A fly in a bottle might buzz its life away without getting anywhere.

You have heard of the drunken ferry-man who one night pulled at his oars for long, but wondered why he never came to the other side, until at last a companion, not quite so "fou," discovered that he had never let go the rope. See that your effort "gits there;" that your exertions are really "cutting ice." If they are not, change your tactics. If a frontal attack is no use, get a move on the flank. Keep at it; do not get discouraged; it is often the last key in the bunch that opens the lock.

OPTIMISM.

Another cheering companion on the "Second Mile" is optimism. I fear I must confess to sometimes getting out of touch with him. That is, of course, a national failing of my countrymen. You all know that the most hopeless pessimist in the world is a drunken Scotsman. Yet the true optimist, whose belief in the bright side is built on conviction, sound knowledge, and confident, buoyant hope, is in his way a truly successful man, even if he should be as hard up as an Irish drover. You have doubtless heard the happy definition of an optimist as the man who, falling out of the top window of a seven-storey building, is heard to exclaim, as he passes the third floor, "All's well so far." His brother is the henpecked man who is thankful he is not a Mormon.

In successful salesmanship the quality of keeping on the "bright side" is a most valuable asset. The man who never knows when he is beaten, who cannot be snubbed—whether he is a British "Tommy" at the front, or one of the million salesmen in this nation of shopkeepers—has the best chance of winning his way to a successful issue. May we all endeavour to walk on the sunny side a little more than we do—to laugh at misfortune's "Jack Johnsons" when they appear, and grow fat in the effort. It has been said that "a smile removes obstacles, overcomes objections, inspires faith, and paves the way for business." Be cheerful as a "business proposition."

You remember that the sum and substance of the philosophy of that most delightful American character, "Mrs. Wiggs," lay in "keeping the dust off her rose-coloured spectacles." More power to her elbow.

TACT.

Another indispensable qualification I would suggest in the equipment of the successful salesman is tact—that diplomatic oil which makes the wheels go round. Even a cat will purr when you rub her the proper way. You have heard of the little lad who wrote that "salt was the stuff that made things taste bad if you didn't put it in." In like manner, tact is the thing that makes for friction and trouble when it is lacking.

I think you will agree that common sense, humour, and true consideration for others, *plus* a gift for seeing the other man's point of view, are the main ingredients in this virtue, the development of which—for it can surely be developed, although to a great extent it is a natural gift—will save us from the silly pride (familiarly known as "swelled head") which "goeth before a fall," will train us to set a guard over our lips, in case, like the Irishman, we "never open our mouth but we put our foot in it," and will make us wise to avail ourselves of every opportunity, not merely for helping ourselves, but for furthering the cause we have at heart.

ENTHUSIASM.

One more test of the true second miler is enthusiasm. It has been said that "Genius is intensity;" but, without posing as geniuses, we can so put our hearts into our work that instead of our duties becoming a daily round of drab monotony, they will become the scene of daily victory, and be a continuous source of education and development. "Do with your might what your hands find to do." If you have not enough to keep you going, emulate Oliver Twist, and "ask for more."

There is no more "catching" virtue than enthusiasm, except perchance it is loafing; for just as one lazy loafer is enough to demoralize a whole school of workers, so one real enthusiast will help to enthuse others, and when all pull together with a will, having, like the old builders of the wall, "a mind to work," then surely the results will come.

There is no room nowadays for the querulous critic who is continually grumbling and growling about his commonplace duties, who questions the why and the wherefore of every order, who is afraid, or too superior, to put his back into anything. No work, however humble, can dishonour a man. Too often it is the man who dishonours the work.

Do not be afraid to tackle propositions new to you. "What man has done, man can do." Better try a thing and make a blunder, than sit still and criticize and do nothing. Do not fear to take the initiative. "Make a spoon or spoil a horn," says the Scotch proverb. "Faint heart never won fair lady." The President of the "B.C.G.A." recently told us that the reason why Scottish workmen in England were not loved by their English fellows was because "they all wanted to be foremen." I only wish that was true, but I "hae my doots." A wise man has said:

Most people take hold of life with the tips of their fingers. They never get hold of the life proposition with that grip and tenacity of purpose and vigour of determination which does things worth while.

They just hang on the outskirts of things, playing upon the surface of their possibilities without ever getting down into the marrow of their being, where efficiency and power dwell.

PUBLICITY.

Some of you perhaps wonder why I have not given you an address on "Publicity." I hope when you consider the matter, you will see that we have never been far away from this subject to-night, as the principles which affect salesmanship, as truly affect publicity. It has been aptly said that "Advertising is Salesmanship on paper; Advertising and Salesmanship are inseparable friends."

In this connection, do not forget that good salesmanship is incomplete without good service. If any link in your service is defective, the best publicity in the world will not make up for the deficiency. Some people seem to think that advertising, like charity, will cover a multitude of sins. It will not; it will only bring them into greater prominence.

What is the good of a newspaper notice stating that gas appliances are going to solve the troubles of a modern household, if, when interest is aroused and orders booked, it happens that, through incompetent advice, unsuitable appliances are selected, and through unskilful workmanship and inadequate supervision in due time badly fitted. A good appliance, fitted and working to a consumer's satisfaction, must always rank as one of the best possible advertisements.

You will therefore see that good service is absolutely necessary, as it includes the three essentials of complete salesmanship:

First.—The machinery for handling orders when they come in (including a trained and competent staff of clerks, fitters, and inspectors).

Second.—The provision of means for demonstrating to the public the various forms of apparatus which are now at their disposal, and educating them as to how appliances may be used with the greatest advantage to them (by show-rooms, qualified attendants, and demonstrators).

Third.—The organization of good publicity: (*a*) By the distribution at various times and in various ways of pamphlets, booklets, and reading matter suitable for the various sections of present and prospective customers, such as the working classes, slot consumers, residential and professional sections, &c. (*b*) By effective and persistent advertisements, including posters, showcards, and newspaper publicity, not only in the form of ordinary "displayed" advertisements, but by contributed articles and general news paragraphs.

These three links are all vitally connected with one another, and must be complete if business is really to progress. Showrooms are a farce if the appliances when sold are improperly fitted; advertising is money thrown away unless it is efficiently backed up by a competent staff, and the inquiries produced carefully followed up. Cases are constantly coming to our notice of good orders being lost through sheer incompetence or lack of the proper machinery for completing the transaction. Some illustrations from recent Association correspondence will prove my contention.

Defective service is apparent from the following cases, which, unfortunately, are only typical:

(*a*) From a country doctor:—

No one called to see me as your letter seemed to indicate. I have made inquiry at our local gas office, but they informed me they have nothing to do with gas-fires. Some gas-fires fixed up for another surgery here in practice are intolerable for smell.

(*b*) From a professor in a district supplied by a gas company, which, if reckoned on annual gas made, would be included among the ten largest Provincial undertakings in the United Kingdom:

I am much obliged for your letter of the 5th inst., and think I ought to explain that it is not the corporation which is apathetic. They are supplying a good stock of electrical appliances. It is the gas company who, so far, has not moved in the matter.

(*c*) We wished to get an opinion as to the best stove from an authority in which we should place more confidence than our local gas company.

Competent service, on the other hand, is proved by the following instances, which, we are also glad to testify, are only typical:

(*a*) You will no doubt remember sending me an inquiry from the above gentleman. I am glad to advise you that we are now carrying out the work of lighting the whole building, which comprises ten offices, a show-room, and a private film theatre. We are fixing seven fires, two gas-steam radiators, 25 brackets, and 14 pendants.

(*b*) It may interest you to know that from the four inquiries you sent us some days ago, we have secured three orders, and I think this is evidence of the valuable work which our Association is doing.

(*c*) You will be pleased to hear that, following up local inquiry by the interested parties, we have been able to obtain an order for a gas circulator, and also the installation of several fires, and we are hoping to still further increase the business.

ADVERTISING.

Some men say that good service only includes cheap gas, the supply, fitting, and maintenance of suitable appliances, or the adoption of favourable hire or loan rates, and that newspaper and other forms of advertising, in the ordinary sense, are unnecessary. Such a line of argument deliberately ignores the fact that some gas undertakings which have all these advantages have, nevertheless, found display advertising profitable. Do these individuals seriously suggest that firms like Pears, Oxo, or Johnny Walker spend the enormous sums they do if it is not good business?

We are well aware that publicity and advertising must be built on a basis of truth, economy, and merit. But these qualifications by themselves will never bring the sales they would if supplemented by first-class publicity. Typewriters and cash registers are, for instance, wonderful inventions; but would they ever have occupied the position they do in the commercial world if their inventors had been content to merely let their merits sell them?

It is a sound commercial truth that, as stated in our Association "Bulletin" for last month, "expenditure upon efficient (and sufficient) advertising is a productive, a highly profitable form of expenditure." Some people seem to question this, or labour under the delusion that there is some trickery in the business. They sigh and say: "Oh well, everybody's doing it, so we must follow suit, though its really only spending a lot of money needlessly." These are the poor old "Half-Milers" in the publicity business, who will make a success only by accident or good fortune.

Surely in nothing is the doctrine and practice of the "Second Mile" more necessary then in advertising work. To quote again from the "Bulletin:"

The words "and sufficient" have been repeated and emphasized advisedly, because it is necessary for us all to bear in mind that in advertising, a half-hearted effort—inadequate expenditure—is sheer waste of energy and money. You can spend £5000 in advertising and lose the lot, when by spending £15,000 you could get your money back several times over.

We could find no finer example of the ultimate success which comes to the man of vision than the case of that famous "Second Miler," Mr. Selfridge, of Oxford Street, who has built up such an enormous business under most difficult circumstances, and amid fierce competition, by an enlightened and inspired advertising policy, combined with service of the highest order. Who can ever question the power of the doctrine I have tried to discuss with you this evening, when such an example of its practical working is constantly before our attention?

Results from higher salesmanship do not come in an hour, any more than results immediately follow good farming. Too many of us are inclined to spoil natural growth by impatiently acting like the little boy who pulled up his bulbs every morning to see how they were growing.

The qualities we found to be useful for the successful individual salesman hold good regarding the larger salesmanship—viz., individuality, steady effort, or as it may be termed continuity of policy, optimism, and enthusiastic belief in the product you have to sell. These, mixed "with brains, Sir," will produce results worth looking at with pride.

I thank you, gentlemen, for a patient hearing, and hope the outcome of our thoughts this evening will prove beneficial to us all, and through us to the various concerns which we serve.

DISCUSSION.

At the conclusion of the reading of the address, which, it was evident, had been keenly enjoyed by the members,

The PRESIDENT (Mr. J. Hewett, of the South Metropolitan Gas Company) remarked that Mr. Mason had given them a treat, and now he had consented to throw the address open to discussion.

Mr. S. B. CHANDLER (South Suburban Gas Company) said he had listened with a great deal of pleasure to Mr. Mason's excellent address, which was written in such happy vein. He did not rise with a view of criticizing what had been said, but to mention a few of the points that had occurred to him, arising out of the address. Mr. Mason was to be congratulated on having presented to them some very good advice, and cogent reasons for going the "Second Mile;" and the address brought home to them the importance of the development of character in their everyday affairs—that was to say, of developing their own character. Without doubt, the man who cultivated this quality, and combined with it forcefulness and thorough knowledge of his own particular line of work, became a moving spirit in his profession, and what was known as a successful business man, which he presumed was the aim and object of every member of the Association. A fundamental principle was that one should grasp one's opportunity. This and constant effort were absolutely necessary to achieve the desired end. He believed it was Walsham How who once said: "Efforts are always successes. It is a greater thing to try without succeeding, than to succeed without trying." Referring to another matter, it seemed to him (the speaker) that there was danger existing in over-confidence. The man who became overconfident in his own abilities and self-satisfied, ceased to improve and soon began to degenerate, which, of course, was a very serious thing. He was glad to hear Mr. Mason bring salesmanship so prominently to the front. In fact, the address was practically on salesmanship. The art of salesmanship was a very real one; and he had been glad to notice that during the past few years it had been receiving the attention it deserved. It was a welcome step, and one which must have far-reaching consequences. In connection with the development of character and personality, the cultivating of an aptitude for looking at both sides of a question, and thereby seeing the other man's point of view, was a most important thing for the man who actually came in contact with the gas consumers.

Mr. D. J. WINSLOW (Lea Bridge District Gas Company) said that, while they were greatly indebted to Mr. Mason, the subject was not one which lent itself to question or criticism. The address went right to the root of the matter dealt with; and they would find the advice most helpful. Mr. Chandler had referred to

over-confidence, which was a danger they must studiously avoid. Arising out of this, they had to guard against the man who talked and who did not really understand the apparatus he was handling. There were men who thought they were very good salesmen, and who went to the consumers and at once started talking. But if the consumer was a man of business, he might retort: "I can do the talking; just show me what you can do." The man who was selling an article should know exactly what it would do and what it was intended for. Mention had been made of the "wobbler," and also of the need for the exercise of tact and diplomacy. Probably most of them did not care for the man who was a wobbler; but, on the other hand, they might not like the man who held too decided opinions, for these sometimes arose from lack of experience. A man who possessed a tendency to "lay down the law" had to be impressed with the fact that tact and diplomacy were essential factors in the making of a good salesman. As had been stated, it was, of course, the case that, even in these days of salesmanship and advertising, there were a number of gas companies who thought they were still in the old rut as gas suppliers, and left too much to outside people. It should be remembered that a builder, for instance, did his job, got paid for it, and cleared off; whereas the gas company remained to bear the brunt of any trouble that might subsequently arise. In looking after things as they would like to do, gas companies, of course, often had great difficulties to contend against. A case came to his mind which bore somewhat on the subject before them. A good-sized institute was being erected in his district, and gas-heated radiators were arranged for in a very large hall, which had big windows each side. The architect decided to put in five points for radiators. The gas company got an order for the piping (but not for the radiators), and it was their business to see what sized radiators were going to be put in, and endeavour if possible to persuade the people to increase the number of points. The builder stated that the intention of the architect was to instal six-tube radiators; and it was pointed out that these would be hopelesly inadequate for the hall, and that even ten-tube radiators would not be sufficient to heat up the place from only five points. The builder, however, would not allow him (the speaker) to approach the architect in any way; maintaining that it was a matter between him and the architect, and that the gas company had no right to interfere. This was the position in which the company found themselves. As a matter of fact, they did not communicate with the architect, but tackled the matter in another way. They knew what firm of makers it was intended to approach, and they dropped a hint to them to see that apparatus of sufficient size was installed.

Mr. CHANDLER said he thought the present tendency was to increase the value of the service to the consumer, and bring it up to a definite standard. In this connection, the classes which were being held, and which were well attended by junior members of the gas industry, were providing opportunities for the men who absolutely did the work to improve themselves. Directors of companies now fully realized that the consumer was the man who had to foot the bill every time, and that by him the gas company had to stand or fall. The matter was one to which gas companies were just now giving special attention.

Mr. MASON, replying to the remarks that had been made, said he agreed about the man who talked too much and knew too little. It was never wise to talk too much; but it was more than unwise to do so when one did not know what one was talking about. A salesman must know what he was talking about or hold his tongue. This was a point which he tried to impress upon his staff when he was in Glasgow. When one was not sure about a thing, it was far better to say to an inquirer, "I do not know, but will try to get the information for you and send it on."

Mr. W. J. LIBERTY remarked that they had had a highly educational and enthusiastic address. There was nothing in it that would not be of use to every young man in the industry. The golden thread which ran through the whole of it was "character." Character in a young man could build up a reputation; but it was necessary to appreciate the distinction between character and reputation. It was the soul of a man that made the character, and grit that brought him along. Character and grit were the two things which were going to tell. When one was acting the part of a salesman, it was well to give a customer credit for knowing at least a little about what one was trying to sell him. This was the day of the young man, and they should all resolve, not only to go the first mile, but cheerfully to travel the second mile. He had great pleasure in proposing a hearty vote of thanks to one of the busiest men he knew in London, for giving them such a fine address.

Mr. W. L. WESTBROOK (North Middlesex Gas Company), in seconding, expressed the opinion that the address would be a powerful stimulant to the real workers. It was a help to them to have such advice as Mr. Mason had just given. Dealing with disputed accounts and complaints generally was a matter which called for as much tact as any part of a gas company's business. If a man started out with the idea that a consumer probably had a real grievance or he would not be complaining, and made up his mind to do his best to really put the matter right, the work was already half-done. It was always necessary to see the consumers' point of view.

Mr. MASON (acknowledging the vote, which was carried with great heartiness) said it had been a real pleasure to be again at a Junior meeting. Perhaps at some future time he would have the privilege of giving them another address.

YORKSHIRE JUNIOR GAS ASSOCIATION.

Annual Meeting at Leeds.

The Eleventh Annual Meeting of this Association was held last Saturday afternoon in the Chemistry Lecture Theatre at the Leeds University. Mr. CHARLES ROPER, of Bradford (the President), occupied the chair; and there was a large attendance.

The PRESIDENT, in opening the meeting, said that the Council had felt that, notwithstanding the disturbance of affairs generally caused by the European War, the winter work of the Association should be proceeded with. At least two of the members were known to have gone to the war, and it was recommended by the Council that membership of the Association should be kept open for them until their return, without their subscription being looked for. He hoped the meeting would support the Council in this.

ANNUAL REPORT AND ACCOUNTS.

The PRESIDENT, in presenting the annual report, stated that the work of the Association was being maintained at an interesting level as regards both lectures and visits. The Council suggested that discussions on papers might form a more prominent feature of the work in the coming session than they had done in the past, and expressed the hope that the members would assist more freely by giving papers and taking part in the debates. Great regret was expressed at the loss of the services of Mr. William Cranfield and Mr. C. V. Townsend by removal, and of Mr. Charles H. Turner by death. It was stated that a full programme had been prepared for the coming session. The year commenced with a balance in hand of £2 2s. 2d., and closed with a credit balance of £1 18s. 11d.; Mr. Garsed (Hon. Secretary) having kept the accounts since the death of the late Treasurer, Mr. Turner.

The report and accounts were adopted.

ALTERATION OF A RULE.

Some discussion took place on the question of a proposed alteration in the wording of the rule which provides that persons engaged in the manufacture of gas appliances (other than articled pupils preparing for the gas profession) should not be admitted as members.

The PRESIDENT stated that by this alteration the members would merely be bringing themselves into line with all the other Junior Gas Associations throughout the Kingdom. He believed the point involved was raised at the beginning of the existence of the Association, and had often been discussed since.

Mr. W. W. ATLEY proposed, and Mr. P. M'NAB seconded, the adoption of the new wording of the rule.

Mr. COOPER proposed, as an amendment, that the rule should be so framed as to retain a right to membership of persons engaged in the manufacture of gas appliances, with some restriction to prevent them visiting works in competition with those in which they themselves were engaged. He argued that the same objection would apply to persons working on residual products as to those engaged on gas appliances.

On a vote being taken, the alteration of the rule as proposed by the Council was approved.

ELECTION OF AN HONORARY MEMBER.

On the motion of Mr. J. W. LEE, it was resolved that Mr. Cranfield be elected an honorary member of the Association, in recognition of his great services throughout its existence; and that a testimonial to him be organized.

THE NEW PRESIDENT.

Mr. LEE then took the chair as the President for the coming year, and said he should be very pleased to do whatever he could for the assistance of the Association during his year of office.

ELECTION OF OFFICE-BEARERS.

The following officers for the ensuing session were elected:

Vice-Presidents.—Messrs. J. Demain and J. B. Balmforth.
Hon. Treasurer.—Mr. P. M'Nab.
Hon. Secretary.—Mr. H. E. Garsed.
Assistant Hon. Secretary.—Mr. F. Peel.
Members of Council.—Messrs. W. W. Atley, A. Edwards, J. H. Hill, F. Scholefield, E. J. Sutcliffe, and (*ex officio*) C. T. B. Roper.
Hon. Auditors.—Messrs. A. Lister and G. H. Walker.

THANKS TO THE RETIRING PRESIDENT AND OFFICIALS.

Votes of thanks were accorded to the retiring President and other officials, for their services during the year.

THE SALES DEPARTMENT OF THE GLASGOW CORPORATION.

Mr. RALPH HALKETT, the Superintendent of the Distribution and Sales Department of the Glasgow Corporation, a former member of the Association, then delivered the opening address of the session. He commenced by recalling the fact that his connection with the Association was only severed by his taking up new duties at Glasgow; and it had been intimated to him by the President that a sketch of his work in that city would be of interest to the members. He admitted that no scheme was so perfect that it was impossible to improve upon it; and though he had seen and helped to develop from its infancy the scheme he introduced into the Glasgow Gas Department, he found on adapting it to his requirements that it could be improved upon and

amended. This scheme he then proceeded to set forth in detail—showing samples of the cards, &c., used. The following are extracts from the address.

The Corporation Workshops.

Glasgow ranks as the second city of the Empire; but I think, in the progressive stand it takes in everything pertaining to gas, that it ranks second to none. I speedily discovered that on every side I should receive nothing but the most hearty support in anything I did for the good of the department; and I am very pleased to have this opportunity of saying how much it helped me to feel that my Committee and the General Manager, and a loyal staff, were ready to co-operate with me on every hand.

In 1869, the Glasgow Corporation took over the control of the gas undertaking. The price then charged was 4s. 7d. per 1000 cubic feet. In 1875, it had risen to 5s. 5d. per 1000 cubic feet; but then the price gradually decreased, until now it is 1s. 11d. per 1000 cubic feet. With the rapid growth of the public taste for gas appliances, the Corporation took into consideration the advisability of starting workshops, in order adequately to cope with their demands. Having acquired a site—fronting on two streets, Walls Street and Stirling Street, and covering an area of 2477 square yards—the workshops were soon fitted with the necessary equipment. The buildings are three storeys high in one part, and four storeys in the other.

The basement of the Walls Street building is used as a meter warehouse, and the first floor is divided into offices for the general staff, the Workshops Superintendent, my own office, and one for my correspondence clerks, in addition to the fittings department. The plant in the fittings shop consists of screwing, pipe cutting, drilling, and grinding machines, which are driven by an 11 B.H.P gas-engine, situated in the workshop. On the second and third floors is the meter repairing department.

The basement of the Stirling Street buildings, together with the first floor, are used as a general store, for the stove and fittings department, both for outside and inside jobbing. A portion is also set apart for the costing office, where all work cards are issued and priced-up on completing work and records kept.

On the second floor is the stove repairing and cleaning shop. The plant includes a polishing machine, lathes, guillotine for the use of tinsmiths, and a drilling machine driven by a 6 B.H.P. gas-engine. The number of grillers, cookers, &c., repaired and overhauled during the last year amounted to almost 19,000. After being cleaned and repaired, the cookers, &c., are stored on the fourth floor. The third floor is utilized as a fire and radiator store and repairing shop, in which are kept all requisites for fires, heating appliances, and appliances to be sent on to the district. It is fitted up with all the necessary benches and equipment, so that fires brought in from the district to be repaired can be properly attended to. The number of fires and radiators repaired during the past year amounted to almost 4000.

So popular have gas appliances for cooking, heating, and power purposes become in Glasgow that it has been found necessary, in order to economize in time, and alleviate the strain upon the original workshops, to augment them by a subsidiary depôt, from which to organize all the work executed on the south side of the river. A building owned by the Corporation in Milan Street was, therefore, utilized for this purpose; and it was one of the earliest innovations that I was called upon to supervise and plan. Having fitted it up with the necessary workshop equipment, a Chief Inspector was installed with 160 men, including inspectors, fitters, labourers, &c.

Gas for Furnace Work.

We specially devoted a portion of the Milan Street premises as a furnace room, and had various types of gas-furnaces erected; so that any consumer proposing to instal this class of appliance is at liberty to visit the furnace room, and see the actual thing at work before making any decision. We have also utilized this room for a series of lectures on furnaces, with practical demonstrations and very satisfactory results.

Notwithstanding that we have done very well indeed in this branch of the industry, I think the future holds great prospects. It is the part of the industry, in my opinion, where the manufacture is still in the experimental stage, and, though advances are being made, there are still boundless possibilities before it. It is up to the manufacturers to work on the necessary improvements if gas as a fuel for industrial purposes is to forge ahead.

Another point that I consider important is that the representatives of a gas undertaking who have to do with these furnaces must thoroughly understand the different types, and the various classes of work they are capable of performing. In order to do this, they must devote the whole of their time to studying and pushing this branch of business. Realizing the difficulty of obtaining a man with this special knowledge, I selected one with good practical training, and we gave him the opportunity of visiting the different makers' works, where he spent several weeks in order to obtain a thorough grip of the principles and building of furnaces. The experiment has well repaid us, for he has since devoted his time to pushing this class of appliance, and giving advice to prospective customers. Any furnace that he knows is being installed, he visits and advises as to the fixing; and when it is ready for work, he demonstrates how to properly regulate and work it. This has been of great service to all concerned, and also the means of economical and efficient working.

In Glasgow, gas-furnaces are used in the following industries: (1) Spring work—one works using 112,000 cubic feet per week. (2) Glass annealing and glory holes, using 150,000 cubic feet per week. (3) Billet heating for forging parts for Diesel engines. (4) Case hardening in motor cars and engineering. (5) Tempering, hardening, and high-speed steel tools. (6) Metal melting. (7) Boilers for chemical works and making varnishes. (8) Sugar boiling. (9) Rivet heating. (10) Bolt making. (11) Plate heating for locomotive parts. (12) Tyre expanding in locomotive works, using 20,000 cubic feet per day. (13) Tube making. (14) Wire annealing and die-plates. (15) Printing works for hardening engravers' die-plates. (16) Heating brass bushes for white metal linings. (17) Flange making. (18) Type metal melting. (19) Glass enamelling.

The gas-boilers used in the making of varnishes are rapidly being installed in preference to coal-fired boilers, and have proved to be quicker and cheaper in doing the same amount of work. The results arrived at in one instance were as follows: With coal firing, the time taken was six hours with a coal consumption of 2½ cwt. With gas firing, the time taken was 2⅓ hours, and with a high-power burner consuming 150 cubic feet per hour, the total consumption was 375 cubic feet. Therefore the approximate cost was about 8½d., free of all labour charges, with the advantage of an increased production and absolute safety from fire, which is a vital factor in the manufacture of varnishes. In this case, the coal alone used cost 11s. per ton, or 6½d. per cwt.

Another set of figures that may interest you are as follows: They have been given by a Glasgow firm, Messrs. Whyte, Thomson, and Co., and show a considerable saving in the working cost experienced by them in using gas for power and manufacturing purposes. By the old system (using steam power and coke for furnaces melting brass and gun metal):

One year's account for power	£75	0	0
One ,, ,, ,, coke	60	0	0
	£135	0	0

Coke costs 16s. per ton.

The average number of melts per day with coke equals four. By the new system (using a 34 H.P. gas-engine and a gas crucible furnace):

One year's account for power	£49	14	6
One ,, ,, ,, furnace	55	4	0
	£104	18	6

Gas costs 1s. 6d. per 1000 cubic feet (manufacturing rate).

The average number of melts per day with gas equals six. Hence we see a saving effected of £30 1s. 6d., with a 50 per cent. additional output.

The Furnace-Room.

The equipment of the furnace-room at present consists of one 10 B.H.P. gas-engine direct coupled to a gas and air compressor of 10,000 cubic feet capacity, made by the James Keith and Blackman Company. This compressing set is now used for air, but can be used to compress gas by the operating of two rack-and-pinion valves. There is a Thorp rotary meter fitted to the gas supply, for registering the gas burned when plant is used this way. The pressure obtained with this compressor is from 1 to 5 lbs. per square inch, and can be adjusted to any desired pressure by a wheel adjustment, directly connected to a relief valve, fitted in the base of the compressor. One 5 B.H.P. gas-engine is direct coupled with a gas-compressor of 5000 cubic feet capacity made by Messrs. James Milne and Son. This plant is used principally to compress gas, and to work in conjunction with air plant, for furnaces made on the Bonecourt principle, when it is necessary to have the gas and air compressed and delivered at the furnace through a Y piece connection at 2 lbs. pressure. The pressures are adjusted by weights on the top of the compressor; the same pressures being obtained with this plant as the first-named one. The inlet and outlet valves are of the screw-down disc pattern, with inspection doors fitted, and each takes 4-inch connections.

There are two dry meters fitted. One 400-light meter is used to register all gas consumed in the furnaces which are fitted in the room, and one 60-light for both engines. All meters are fed from one main service, and controlled by a main cock on it. Thus all the gas supply is cut off when the room is not in use.

There are three rows of 4-inch pipe running parallel to each other and 6 inches apart. Connections on each are left every 6 feet and screw-down wheel-valves fitted on each. All connections for furnaces are made by malleable fittings. Wheel-valves are to be recommended when connecting all furnaces, owing to the fine adjustment to be obtained by using them. The various furnaces fitted in the room are—

Natural draught furnace, 3 ft. by 2 ft. by 15 in.	Richmond.
Air-blast furnace, 3 ft. by 2 ft. by 15 in.	Manchester Furnace Company.
Natural draught furnace, 2 ft. by 20 in. by 9 in.	John Wright.
Twin muffle-furnace, 21 in. by 14 in. by 6 in.	Fletcher Russell.
High-speed tool furnace	Richmond.
Twin rivet-heating furnace	Manchester Furnace Company.
300-lb. tilting brass-melting furnace	John Wright.
Bar-heating forge	Fletcher Russell.
150-lb. stationary brass-melting furnace	Richmond.
Double-ended bolt-heating furnace	Manchester Furnace Company.
60-lb. twin crucible brass-melting furnace	Fletcher Russell.

Catering for Particular Needs of Consumers.

Before proceeding to detail the organization and functions of the other departments coming under my supervision, I should

like to point out one or two special ways in which we have endeavoured to cater for the particular needs of Glasgow consumers. As a large part of the city consists of tenements, space is often a great consideration; and we frequently convert the existing kitchen range oven into a gas one. A piece of ¼-inch iron pipe is bent to the shape of the oven, and is tapped at a distance of every 4 inches and three-flame rat-tail burners inserted, and fixed at the bottom of the oven. The oven door is raised by inserting washers on the hinges, in order to obtain proper ventilation. This is a point that needs particular attention to ensure safety. In many cases we are able to obtain a consumer by this means, when lack of space prevents the installation of a cooker. In conjunction with this, we fix an appliance called a lifting range fitting, which we fix on the top of the grate. It consists of two ring-burners and a grill, and is constructed on a swivel joint, so that when not in use it can be thrown up, and the use of the top of the grate is then available.

Free Cooking Appliances.

In June, 1911, the policy of giving all cooking appliances free was started—a scheme which has fully warranted its adoption. In support of this the following figures may prove interesting. From May, 1911, to May, 1912, 10,576 cookers, 2631 grills, and 8489 ring-burners were fixed. From May, 1912, to May, 1913, the figures were 23,452 cookers, 2595 grills, and 18,402 ring-burners. From May, 1913, to May, 1914, 18,817 cookers, 470 grills, and 7723 ring-burners were fitted. Up to date, we have 192,152 cooking appliances fixed on the district.

The cookers on loan are of five different sizes, and are made to our own design and specification. In June, 1912, the hiring-out of gas-fires at a nominal rental was inaugurated, and this has also proved a great success. During the first twelve months, 12,589 fires were fixed on these terms; and last year the number reached 14,198. For the current year, the orders seem to be equal to, if not in excess of, this number. The total number of heating appliances on the district is 35,089.

Organization.

In the organization of the various departments of a large undertaking such as Glasgow, it is of first importance to see that there is no overlapping of work, that the work is carried out expeditiously, that proper records are kept, and that the whole scheme works harmoniously.

During the winter months, which were my first in Glasgow, we were excessively busy; and I could see that it was impossible just then to make any alterations of importance. But as the workshops, show-rooms, and complaints departments had not previously been amalgamated under one chief, but each superintendent had been responsible to the Engineer and General Manager, it was a matter of necessity that at the earliest opportunity some scheme should be introduced common to all. Therefore, at the end of the financial year—in the spring of 1913—I inaugurated one, of which I had already had ample proof of the applicability. In several instances, as the scheme was introduced, it was found necessary to enlarge and improve upon the original; and for a time we had uphill work, while the old working overlapped the new. The staff entered heartily and loyally into the matter, and within a period of twelve months each department had mastered the routine; and now, though the maximum amount of work coming in has been maintained throughout, they readily acknowledge that their labours are very materially lessened. They are no longer working at "high pressure," nor is "overtime" at all necessary.

The Function of the Show-Room.

In the course of his full explanation of the card system employed, Mr. Halkett said: The show-rooms do a large turnover in sales, and carry a good stock of all the leading lines. All accounts for goods received and work done by the department are rendered from the show-rooms. In this way, a good purpose is served, by bringing consumers to the show-rooms, and interesting them in the different appliances displayed there. We endeavour to make our windows as interesting as possible, and to advertise the appliances we are particularly, for the time being, desirous of bringing to the notice of the public. For instance, when passed by the Committee that hot-water circulators should be fixed free, on simple hire or hire-purchase, we placed a bath in the window, with a specimen circulator in action, and an apparatus by means of which the water was turned on automatically. Circulators were fitted up to portable installations, and connected to wash-hand basins, and hot water allowed to flow into them. The hot water procured could be seen by any passer-by as it flowed into the bath and wash-hand basins; and this was a splendid advertisement for the circulator (and incidentally for other appliances also) to consumers who perhaps would not otherwise have visited the show-rooms. We have placed 153 of these circulators on the district on simple hire since June.

In furtherance of the scheme, we have a set of model furnished rooms on the second floor of the show-rooms, and customers are taken and shown the different lights, fires, heating arrangements, &c., in actual position, with similar surroundings to those they would have in their own apartments. These model rooms comprise lounge, dining-room, bedroom, bathroom, and kitchen. In the portion set apart for the kitchen, cooking demonstrations are given twice weekly, so that customers can see the various gas cooking and heating appliances in practical use. Many sales have resulted therefrom.

Meter-Repairing Department.

Some 36,000 meters are received from the district in a year, comprising 26,000 ordinary and 10,000 slot meters. These all go to the prover to be initial tested, and all defects are duly entered in the meter register. The number of meters repaired per year is 23,000, consisting of 12,000 ordinary, 3500 slot, and 7500 converted ordinary to slot meters. Of the latter, 4100 are done by the makers, and 3400 by our own tinsmiths. The meters under repair are handed to the tinsmiths, who remove the tops and valve plates and send the meters to the grinders to have the valves ground. They are then passed on to the sounder, to have their diaphragms and valves tested for escapes, and to have the defects located, after which the meters are returned to the tinsmiths for repair. After being repaired, the meters go back to the sounder to have the valves and diaphragms tested, and then on to the tester, who seeks escapes, and adjusts the tangent for measuring. The measurer has then to measure for quantity. They are afterwards topped by the tinsmiths, and then tested for back-flame. The meters now get two coats of paint, are dated, and are then sent to the Government Stamp Office to be tested. Those found registering according to standard measurement are stamped, the others are returned to the meter department to be re-adjusted. The number of meters rejected per annum is less than 1 per cent. About 40,000 meters are sent to the district per annum, of which 18,000 are ordinary and 22,000 are slot-meters. New meters are ordered as required, and number about 6000 per annum. Of these 1500 are ordinary and 4500 are slot meters. Some 175 men are employed in the meter-repairing department. On an average there are 100 tinsmiths repairing meters, and 12 tinsmiths are employed on departmental work.

Advantages of the Card System.

If any undertaking is to be worked on economical and efficient lines, it is most essential that every detail of the workings should be available in the quickest and easiest manner possible. I know of no system where this is obtained so readily as by the card system. By means of it one is able to trace an appliance from the time the order is given, to its completion, with every detail and cost, no matter what may have been the lapse of time ere the information is required. It enables the various officials to maintain an even proportion of work in their departments, without either undue pressure or unnecessary slackness of labour, and the chief is likewise kept in touch by the periodical statements made to him. Also there is an unfailing maintenance of accuracy, as one part of the scheme must check and balance the other.

Whatever the scheme introduced, however, it is most important that there should be perfect confidence in it; for there will be many difficulties to overcome, and checks may arise to temporarily discredit it. But complete confidence and perseverance will help to win-through.

Thanks to Mr. Halkett.

Mr. Roper, in moving a vote of thanks to Mr. Halkett for his address, said nobody could fail to appreciate such a system as that which had been outlined. He had shown the members what a large amount of work was necessary in order to carry out a system on his side of the gas industry, and also that in many cases there was plenty of scope for the improvement of the existing machinery.

Mr. F. Clegg, in seconding the proposal, remarked that it was a pleasure to see Mr. Halkett among them again, and said his address showed that he had taken the fullest opportunity of developing his side of the gas business. His system seemed like the work of a master in his own department. Everything which had been described was so concise and yet so comprehensive. Mr. Halkett evidently knew where to put his fingers on the remotest thing that might occur in connection with his particular department.

Mr. Halkett, in reply, said that when he went to Glasgow he found that he had a unique opportunity. His duties commenced in the month of October, and he found complaints dating back as far as April. As it was obviously impossible to begin with the system then, he had ample time to think over its application to Glasgow. It was a system which he had had the advantage of seeing started in a most progressive undertaking, where it took four years to develop it to a state of efficiency. The Glasgow undertaking was on such a large scale that it was absolutely essential that everything should be kept on the go in systematic fashion. He had been fortunate in having a most loyal staff, who had given him every possible assistance. Of course, they had to arrange adaptations to local conditions; and one thing they had arrived at was a way of getting in a circulator in circumstances which were very unlikely by a contrivance which he thought they would presently see described in the British Commercial Gas Association's "Bulletin."

The meeting then closed.

The "Thomas Hawksley" Lecture.—We learn from the Secretary of the Institution of Mechanical Engineers (Mr. Edgar Worthington) that Mr. Bernard W. Bryan, M.Inst.C.E., the Chief Engineer of the South Essex Water Company, will deliver at the Institution, Storey's Gate, S.W., on Friday next, the lecture prepared by his father, the late Mr. W. B. Bryan, on "Pumping and Other Machinery for Water-Works and Drainage." The lecture will be repeated in Manchester the following Tuesday, and in Birmingham on the 10th inst.

FIRE CLAY GOODS, AND THEIR USE IN GAS-WORKS.

By Thomas Holgate, F.C.S., M.Inst.C.E.

(*Continued from p.* 364.)

Arising out of a law-suit between the Caledonian Railway Company and the Glenboig Union Fire Clay Company, Limited, have come some exact investigations into the properties of Glenboig fire-clay of importance to all makers or users of fire-bricks. The precaution must here be taken to note that "Glenboig" fire-clay and "Glenboig seam" are terms of somewhat wide application; and while doubtless the one now about to be discussed is the more important, yet it must be strictly defined in order to prevent misunderstanding. The Railway Company asked for an interdict against the Glenboig Company working the fire-clay underneath and adjacent to their railways in the parish of Old Monkland. The following facts came to light in the pronouncing of judgment in favour of the Glenboig Company. The fire-clay in question, so far as under the railway, lay at a depth varying from 60 to 140 feet from the surface. It was worked by underground miners, according to the stoop and room system, and was so hard that it required to be removed by blasting. In composition, it was distinguished from ordinary clay by its containing a large proportion of refractory materials, which made it valuable for the manufacture of bricks capable of resisting high temperatures. The upper strata consisted largely of other seams of clay and fire-clay which were of inferior quality for commercial purposes; but there also occurred some bands of sandstone and whinstone, separating the various layers or seams of clay. That the fire-clay in question was a seam of only from 5 to 8 feet in thickness, and was worked at a considerable depth by mining, indicated that it had a character distinct from the strata above, however much some of these might resemble it in their constituent elements.

For the further geological information as to this fire-clay the writer is indebted to Mr. J. W. Gregory, D.Sc., F.R.S., and for the chemical to Mr. D. P. M'Donald, M.A., B.Sc. The fire-clay is quite distinct from the clays found associated with coal beds, the typical English carboniferous underclays, for no stigmaria rootlets could be found anywhere in it, though in the overlying sandstones good specimens have been seen. There is an absence of other organisms in the Glenboig fire-clay—facts noteworthy because the bricks made therefrom have a high reputation. Above the fire-clay there is a series of sandstones, above which there is often a thin coal seam; while above this seam is a band of dark shales in which marine fossils exist. Table IV. gives the sequence of beds in a recent bore.

Table IV.—*Showing Strata Adjacent to Glenboig Fire-Clay.*

Strata Passed Through.	Ft.	In.
Made ground	4	0
Broken whin [quartz diabase]	3	5
Soft broken clay	4	6
Hard ironstone rib		4
Broken clay	1	0
Broken sandstone	32	0
Dark shale	2	6
Ironstone rib		2
Sandy shale	2	0
Coarse sandstone and shale	1	8
White sandstone	10	3
Coarse sandy shale	12	0
Shale with plies of coal	5	10
Ironstone		3
Dark sandy shale	10	9
White ,, ,,	4	0
Dark ,, ,,	2	6
Compound	6	2
Fire-clay	6	4
	109	9
Dark variegated shale	3	0
Hard white sandstone	1	6
Dark shale	2	0
Roman cement		10

The Roman cement lies, according to Mr. Hinxman, of the Geological Survey, from 40 to 50 feet above the Castle Cary limestone, so that the fire-clay is near the base of the Millstone grit. The fire-clay is usually jointed into small irregular angular lumps, the surfaces of which are abundantly slicken sided. [The last term means the polished striated surfaces of joints, beds, or fissures of rocks glazed over with a film of calcareous or siliceous matter.] This appearance occurs in most thin seams of homogeneous clay which have undergone much contraction, and as is common in most of our English fire-clay. Microscopic examination of the clay shows that its grains are often very fresh and angular; while many of the flakes of felspar have their cleavage angles quite sharp, and some of the felspar is surprisingly fresh.

The chief constituent of the fire-clay is a fine-grained clay substance, containing grains and flakes of various other minerals. Professor Fawsitt isolated from the clay a white hydrous silicate of alumina, which, on analysis, was almost identical with kaolinite Al_2O_3, $(SiO_2)_2$, $(H_2O)_2$, although it may contain more combined water. But microscopic examination shows that it is amorphous and not crystalline. It is one of those forms of clay substance which is not kaolinite; and if this material is to be referred to a particular mineral species, Dr. Gregory would include it in halloysite, the amorphous hydrous bisilicate of alumina. The only difference in ultimate composition between kaolinite and halloysite is in the proportion of water. Whereas kaolinite has 14 per cent., halloysite may have up to 20 per cent.

Under the microscope the optical properties of the Glenboig clay agreed with halloysite and with the finest substance found in the Seaton fire-clay. Kaolinite is the chief constituent of china clay, and scales thereof occur in the clays of Bovey Tracey, and in a sample of Stourbridge clay, though in each case mixed with halloysite; but Dr. Gregory was unable to find any kaolinite in the Glenboig fire-clay or any Scotch clays. The clay substance in them is either an amorphous silicate or excessively fine particles of quartz. Clay substance in general includes much more than halloysite; for it is sometimes silica in the form of quartz flour, or it may be kaolinite or the dust of other silicates of alumina, or fine grained sericite or other white mica. Some fire-clays near Newcastle-on-Tyne are formed of sericite, and much clay which miners call talc and dolomite is only sericite. In Glenboig fire-clay there is, however, comparatively little white mica.

The commonest inclusions in the clay are grains of quartz, which is in large grains. It thus acts as a refractory constituent, and the clay behaves better as a fire-clay than might be inferred from a bulk chemical analysis. There are occasional crystals of zircon and abundant needles and granules of rutile (TiO_2); and hydrated iron oxide occurs in grains and in occasional segregations. The chemical nature of the Glenboig clay substance tends to confirm that deduced from the microscopic examination—viz., that it is halloysite. Table V. contains three analyses thereof, placed alongside that of pure kaolinite.

Table V.—*Showing the Relation of Glenboig Clay Substance to Kaolinite* (Al_2O_3), $(SiO_2)_2$, $(H_2O)_2$.

Name and Formula Chemical Component.	Analysis by D. P. M'Donald.	Analyses by Dr. C. Fawsitt.		Percentage Composition Calculated from the Formula for Kaolinite.
Silica, SiO_2	46·67	48·05	46·60	46·5
Alumina, Al_2O_3	37·65*	36·53	37·20	39·5
H_2O at 105° C.	2·13	13·45	13·85	14·0
H_2O combined	12·66			
Lime, CaO	0·16	..	..	..
Magnesia, MgO	small amount	..	..	..
Total returned	99·27	98·03	97·65	100·0

* Includes a small amount of ferric oxide, Fe_2O_3.

Allowing for the free silica (quartz) found in the Glenboig clay, and then calculating the data of Dr. Fawsitt and Mr. M'Donald, so as to be more strictly comparable with kaolinite, the former show an excess of water of 0·65 per cent., and the latter of 1·5 per cent.—not of itself a sufficiently large excess to be conclusive as between halloysite and kaolinite. When, however, the clay substance was heated with concentrated hydrochloric acid it was completely decomposed, indicating its affinity with halloysite rather than with kaolinite. Le Chatelier gives the composition of halloysite as the same as kaolin, *plus* at least one molecule of water; and these, as well as other aluminium silicates, he found to respond differently to accessions of heat up to 1000° C. One of these, allophane, is important as being composed of alumina and silica as sillimanite [*ante*, p. 363], which exists in porcelain, but contains also water of combination. Not only does this phenomenon possess technical importance, but it has been shown that, even after ignition, halloysite possesses distinctive properties; and so from all points of view we may regard the clay substance as fundamentally important in Glenboig fire-bricks.

It must be remembered that we have been so far discussing the chemical composition and physical properties of the washed clay substance, leaving out for the moment the impurities or fluxes that may ordinarily accompany the same. These latter will best be considered after dealing with the sideroplesite, found as an inclusion in the Glenboig fire-clay, and present there, says Dr. Gregory, as zonal crystals of a hexagonal carbonate belonging to the series of dolomite and siderite. They occur in abundance on certain layers, as, for example, in the clay known as the "compound" [see the bore-list, Table IV.] above the valuable fire-clay beside the Gartverrie Haulage in the Star mine. A 5-feet seam full of these crystals was passed through at another bore, and described as "coarse dark fakes"—a local term for laminated sandy clay or sandy shale. They are recognized as coarse grains by the naked eye; and that these are not quartz grains can be recognized by their softness.

The chemical analysis corresponds to a fairly simple juxtaposition of metallic carbonates with about 15 per cent. of accessory matter. The carbonate of lime equalled 2·78 per cent., the carbonate of magnesia 7·08 per cent., and the carbonate of iron ($FeCO_3$) 74·97 per cent., or total carbonates 84·83 per cent.—leaving 6·49 per cent. of ferric oxide (Fe_2O_3) and 8·06 per cent. of matter insoluble in dilute hydrochloric and sulphuric acids. The small balance, under 1 per cent., is water by difference. The chemical composition of this sideroplesite marks it at once as an undesirable component of a fire-clay, in strong contrast to the admirable clay substance previously described. What proportion by weight of this impurity may exist at various parts of the same Glenboig seam we have no means of judging; but published

analyses, especially one of recent years, would seem to show a comparatively small admixture of the fluxing agent.

A comparison of the foregoing facts with the analysis made by Mr. J. T. Norman in September, 1909, of Glenboig fire-clay is most instructive. First of all, the alkaline oxides. The most powerful fluxes are absent from (1) the clay substance, (2) the sideroplesite, and (3) the commercial clay. Secondly, the lime and magnesia, so largely present in the sideroplesite, are only present as traces in the commercial clay, indicating a low proportion of sideroplesite. Thirdly, the ferric oxide in the commercial clay is 1·8 per cent., against 6·49 per cent. in the sideroplesite, and but a small quantity in the clay substance; while no ferrous oxide appears in the analysis of the first, although predominating in the sideroplesite. Fourthly, titanic oxide is present in about the usual amount in the commercial clay, and is noted as being present in the form of rutile in the clay substance, but without being specifically mentioned in the sideroplesite. Fifthly, the percentages of silica, free and combined, as well as the alumina and water of the pure clay substance and the commercial clay are in close agreement, as shown by Table VI.

TABLE VI.—*Comparing the Hydrous Aluminium Silicate in Glenboig Clay, Commercial and Selected.*

Nature of Component.	Commercial Per Cent.	Selected Per Cent.
Silica free	3·03	2·40
,, combined	43·20	44·27
Total silica (SiO_2)	46·23	46·67
Alumina (Al_2O_3)	36·55	37·65
	82·78	84·32
Water expelled at 105° C.	—	2·13
Water expelled above 105° C.	13·20	12·66
Name of analyst	J. T. Norman.	D. P. M'Donald.

This comparison would lead us to infer that it is practicable to largely separate, in the mine or in the brick-works, the sideroplesite from the essential clay; and a review of all the facts of Professor Gregory's investigation points to the following summary: The clay is an aluminium silicate in which the ratio of alumina to silica is as 1 to 2, accompanied by a small excess of silica in the free state. The silicate is amorphous, and contains water of combination, which is suggestive of halloysite, as do the other properties. But whether this differentiation from kaolinite be of high practical importance or not, the ratio just mentioned is undoubtedly so. The absence of alkalies and alkaline earths from the commercial clay is, on the other hand, valuable; the only deleterious ingredient being a small percentage of iron, and about the same percentage of titanium oxide. These components are consistent with a high degree of refractoriness, and appear in favourable contrast with analyses published some years ago when the percentage of iron was greater than it is now. In those days, students of fire-clay goods as required in gas-works were puzzled to know why bricks showing black specks upon them should be so refractory; and this problem was accentuated when it was known that other special brands of brick rich in iron were esteemed for their resistance to the heat of the combustion chamber of retort-settings. The investigations into the presence of iron in fire-clays, and its removal on a commercial scale during recent years, make it highly probable that these anomalies are coming to be understood and to be provided against.

(To be continued.)

FIRING GASES BY ADIABATIC COMPRESSION.

THIS subject has lately been investigated by Messrs. Harold B. Dixon, Lawrence Bradshaw, Colin Campbell, and J. Murray Crofts, and the results recorded in the "Transactions" of the Chemical Society for the present year [Nos. 2027 and 2036]. The investigations were divided into two parts; the first being devoted to the photographic analysis of the flame, the second to the ignition-points of mixtures containing electrolytic gas. The following is an epitome of the results.

The first series of experiments were undertaken in order to study the initiation of the flame produced by the adiabatic compression of gases. The gases, contained in a stout glass tube, were compressed by a piston moving between supports, and forced in by a falling pendulum; and the flames produced were photographed on a rapidly moving film. The photographs showed: (1) That the piston was not stopped at the moment the gases reached their ignition-point, but at the moment the moving force was removed. (2) That the nature of the flame depended partly on the rate at which the piston was driven in. (3) That no violent compression waves were set up, though such waves did exist when the mixtures were fired by a spark. (4) That explosive mixtures of gases did not "detonate" when they were fired by adiabatic compression, and that the real ignition point was not synchronous with the appearance of the flame. (5) That the pre-flame period is not negligible, and therefore in any determination of the ignition temperature by this method the piston must be stopped at the beginning of that period.

In the second series of experiments, the ignition-point of electrolytic gas was found to be 526° C. The addition of excess of oxygen lowers the ignition-point until the limits of inflammability are reached. This is contrary to the results of Falk ["Journal of the American Chemical Society," 1906-7], who found that the mixture H_2+O_2 had the lowest ignition-point, and that the addition of more oxygen resulted in a raising of this point. Nitrogen or hydrogen added to electrolytic gas raises the ignition-point progressively, and acts apparently as an inert gas. In the case of the former, the ignition-point may be calculated with close approximation from the formula $t°N = (526 + 11x)°$, where x is the number of volumes of nitrogen added to three volumes of electrolytic gas; the mixture being denoted by $2H_2 + O_2 + xN_2$. Similarly, for hydrogen mixtures, $2H_2 + O_2 + xH_2$, the ignition-point is given by the formula $t°H = (526 + 18x)°$. The limit of inflammability is reached roughly by the mixture containing 14 volumes of added gas to 3 volumes of electrolytic gas.

CORNISH ASSOCIATION OF GAS MANAGERS.

The Autumn Meeting of this Association was held at Truro on the 11th ult. Mr. H. H. Hoare, of Falmouth, who has been Hon. Secretary of the Association since its foundation in the year 1908, was presented, on behalf of the members, by the retiring President, Mr. S. J. Ingram, of Truro, with a case of pipes and a silver cigar case, in recognition of his services.

Mr. Hoare suitably thanked the members for the very kind things they had said, and the tangible token of their esteem.

The retiring President (having been heartily thanked for his services) proposed, and Mr. H. E. Riley, of St. Austell, seconded, that Mr. Hoare be elected President for the ensuing year, which was carried unanimously. Mr. H. E. Riley was unanimously elected as Hon. Secretary on the proposition of Mr. Greenaway, of Bodmin, seconded by Mr. Kingwell, of Falmouth.

The Spring Meeting of the Association will be held at Truro the day of the opening of the Truro Gas Company's vertical retort installation.

The National Dye-Works Scheme.—It was stated in the "Manchester Guardian" last Saturday, on what was believed to be good authority, that Messrs. Read Holliday and Sons, Limited, of Huddersfield, have acquired a large financial interest in the new national dye-works enterprise. Two of the Directors of the Company—Mr. J. Turner and Mr. L. B. Holliday—are to be Directors of the State-aided scheme. The Company have a share capital of £160,340, and a debenture issue of £46,900; and they recently declared a dividend of 10 per cent. for the fifth year in succession. On the question of raising the suggested capital of £3,000,000 for the national scheme, a Yorkshire dyer is reported to have said it was quite hopeless to expect the dyers to find it. If it was raised, it would be found either by the Government or by the manufacturers who might have the capital to spare. The dyers would hold their money, and wait till after the war. Their interest was to prevent competition, and keep themselves out of the hands of a monopoly.

Proposed New Calorific Standard for Canada.—In the current number of the "Intercolonial Gas Journal of Canada" it is stated that the Inland Revenue Department have, it is understood, had under consideration for some time the question of determining what shall be the calorific standard for manufactured gas throughout Canada. Though this value has not yet been finally decided upon, our contemporary has reason to believe that it will be fixed at 550 B.Th.U., with a permissible variation of 4 per cent. before the penalty is imposed. In other words, the net value of the standard will be 528 B.Th.U., below which a penalty would be incurred. It is also stated that satisfactory progress is being made with the installation of calorimeters in the testing offices from Victoria to Halifax; and it is expected that all will be in readiness for the inauguration of the new regulations on the 1st of April next. However, before the standard is fixed, all parties interested will be given the opportunity of discussing the whole question with the Minister of Inland Revenue.

Removal of Meters from Consumers' Premises.—An inquiry was made, through the "Question Box" of the "American Gas Institute News," in regard to leaving meters in consumers' premises instead of removing them when the use of gas was discontinued. It was answered as follows by Mr. F. R. Hutchinson, of Cleveland (Ohio): "Out of 160,000 meters in service in Cleveland, we annually lock or transfer (without the formality of locking) about 75,000 meters; 90 per cent. of our meters are locked and 10 per cent. removed. Locked meters are left in premises 90 days before being removed. Readings are regularly taken each month of locked meters, as well as those in service, wherever it is possible to gain access to the premises. We have been locking all meters when tenants remove from premises (except where buildings are to be remodelled or torn down) for the last eight years. Labour saving in setting and removing is one reason for this procedure; but the chief point about locking meters is in the service rendered. Meters are occasionally lost or stolen; but the average is only six meters per year."

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

The Suggested New Factor in the Sliding-Scale.

SIR,—I thank you for your friendly criticism of my suggestion of the need for alteration in the "sliding-scale," and am glad you agree that it is defective [*ante*, p. 348]. Any sound method of remedying such defect, one may imagine, would be generally acceptable. A slight permanent increase in the "standard dividend," however, would not meet the case, which is based mainly on the fact that legislation has caused a permanent increase in the cost of coal, together with the supposition that future enactments may trend more and more in the same direction. Whether a neutral zone would be sufficiently flexible may be doubted.

If it be granted that, so to speak, a new factor has intruded into the sliding-scale equation, the latter must inevitably be correspondingly complicated, to equalize the sides, if the sliding-scale is to survive.

There is no question of appeal to the benevolence of Parliament, but to its sense of justice. No other industry has been, or would be, forced to place on the shoulders of its shareholders or owners the whole, or even a part, of any cost imposed upon it as a result of legislation; and under a standard coal price sliding scale (which would be designed to merely prevent injustice to the large body of shareholders who have subscribed to existing sliding-scale companies under parliamentary conditions that are now injuriously affected by the results of subsequent legislation), if the figure went below such standard, the consumers' interest would be safeguarded by the original sliding-scale, which would then be operative.

The standard coal price might vary for each company or locality in the same way as does the standard price of gas; and it is not quite clear how the fixing of such a standard would bind a company to the use of a particular coal, or restrict its freedom to go to any source of supply.

An inflexible standard coal price, the exceeding of which would, if necessary, enable the price of gas to be raised without involving a reduction of dividend, would, it is true, also cover any increase in coal price due to other than legislative causes; but as the price of gas could not be raised so long as the dividend was earned, and the latter could not be increased without a reduction in the price of gas, the consumer's interest would appear to be adequately looked after, and certainly no injustice would be inflicted on him.

The ordinary investor contemplating the Dublin precedent might well be excused for saying *absit omen*. Nevertheless, if you could see your way to give its terms, with which I am not familiar, it would be interesting and perhaps useful.

J. KELLY.

Bridlington, Nov. 26, 1914.

[The subject of this letter is dealt with in an earlier part of this issue, p. 462.—ED. J.G.L.]

The War and Capital-Raising by Statutory Gas Companies.

SIR,—The financing of statutory gas companies will (notwithstanding the expressed views of some, who plead delay) have to be dealt with during the period within which the war will exercise a very material influence over the Money Markets and the world's finance—a period which will extend in time considerably beyond the signing of the terms of peace. In fact, the conditions may then be even less advantageous to gas companies than they are to-day.

National and industrial capital will be in such demand that terms are likely to be offered for its use even in excess of what gas stocks realize to-day—"about 5½ per cent. on the investment." Nor is it my view that materials will be procurable at anything under the present rates.

It is true that structural steelwork has been enhanced in value to some extent, but is not as high in price as during the South African War of 1899-1900.

Various grades of cast iron to day are at an unusually low level of prices, and cannot recede much lower, but, on the contrary, are more likely to enhance in value, with the inevitable result that all that is made from it must be sold at a higher price.

The question, therefore, appears to be: "By what means can those who need it raise capital without imposing an unfair obligation on the gas consumer and the gas shareholder?"

To issue ordinary stock paying 5 per cent. to-day, it must be sold at under par value, as also a 4 per cent. debenture stock; and, while the exact ratio may depend upon local conditions—small quantities of stock offered locally often realizing better value than an issue on a larger scale—the fact remains that gas companies cannot to-day raise capital on a basis approaching that at which it has been customary for so long in the past.

To issue either ordinary stock or debenture stock under par value is to impose on the undertaking a permanent burden which the consumer shares in a much larger ratio than the gas shareholder.

It is questionable if those who have the power, and do issue preference stock—such as was done in the case of Croydon—would be as successful in other cases as it has been in this case. We, therefore, seem to be reduced to a narrow choice as to how the object in view is to be attained.

The Government offer of absolute security equal to 4 per cent. on the War Loan will have established a minimum figure for some time to come; and those who want to invest capital in industrial concerns will be more likely to seek something approaching absolute security at a moderate rate of interest than a speculative return offering somewhat greater monetary advantages.

By the powers enumerated in the "Model Clauses," gas-works capital is now based on the principle of 75 per cent. of ordinary or preference stock and 25 per cent. of loan capital, secured as a mortgage on the undertaking. To an ordinary man of affairs, a mortgage based on a 25 per cent. valuation affords a very handsome security; and in the case of gas undertakings (nearly all of which consistently pay their dividends without effort) they furthermore have special legislation enabling them to make profits always vastly in excess of what the mortgage or debenture capital requires. This seems to suggest a way out of the difficulty; and the suggestion I have to offer is that steps should be taken to enable statutory gas companies to raise a larger proportion of mortgage or debenture stock than the "Model Clauses" at present allow (with corresponding cancellation of their powers with regard to ordinary stock), at a rate of interest not exceeding 5 per cent., as may be determined at the discretion of the Company.

Whether or not such an issue should be redeemable, is a matter for consideration. Personally, as it offers a cheaper way of financing gas companies (in which the consumers' interests are far greater than those of the shareholders), I see no objection to such borrowing powers being increased beyond the limits prescribed; and where issues of this kind have to be made so much above the normal rate of interest, there should be power to redeem them, and re-issue when market conditions are more favourable.

As to the means by which these powers should be obtained, it is not easy at the moment to foreshadow. It would be preferable if some enabling Bill could be passed, and the expenses of individual application to Parliament be avoided. But, as the proportion of loan capital to ordinary stock varies very considerably with present-day undertakings, the financial basis of many companies might be materially disturbed, or, in other words, could not be properly preserved by a "Common Clause Bill."

It may, however, be stated—in view of the promises which the Treasury have already made as to assisting local authorities in raising capital at moderate rates of interest, for work to be carried on during the war period—that they would not look unkindly upon similar demands on the part of statutory gas companies, whose position is more acute than that of local authorities.

By the "Board of Trade Returns," it appears that the loan capital raised in relation to ordinary capital by statutory gas companies represents 16·68 per cent. of the total capital raised. There, therefore, appears to be a wide margin as security for a mortgagee, if this sum were greatly increased.

Then again, as to the proportion of loan capital to ordinary stock of the London and suburban companies, it is found to vary from 11¼ to 22½ per cent., and in the case of certain provincial companies from 9 to 18 per cent. It, therefore, appears that there is a wide margin to permit of capital being raised for company purposes on a debenture basis, which will not only tide-over the present stringency, but result in a more economical method of financing gas undertakings hereafter.

W. R. HERRING.

Palace Chambers, Bridge Street, Westminster, Nov. 27, 1914.

[The subject of the foregoing letter is referred to in the editorial columns to-day.—ED. J.G.L.]

Weighing Attachments on Retort-Charging Machines.

SIR,—We notice under the heading of "Novelties in Retort Benches and Working," some editorial remarks in the "JOURNAL" for Nov. 17, in which you deal with the question of weighing the charges for retorts as quite a new idea. We would like to point out that we have fitted weighing chambers on some of our machines for a considerable number of years—in fact, the first one was erected at the Stapleton Road Gas-Works, Bristol, in the year 1906.

The arrangement of the machine referred to consists of a weighing chamber and a large dial. The operator watches the pointer on the dial; and, when the predetermined weight is registered, he shuts off the coal supply.

It would assist us considerably if you could add a note in your "Correspondence" column mentioning this point, as we do not like to think of the Americans obtaining credit for ideas which we have had in successful operation for such a long time.

W. J. JENKINS AND CO., LIMITED,
per W. S. SMART, General Manager.

Retford, Nov. 23, 1914.

[We did not think (although the indication was not so clear as it might have been) that our reference, in the "JOURNAL" for the 17th ult., to the weighing of retort charges would have been construed as, on the point of novelty, alluding to this country. The article distinctly showed that we were dealing with novelties in conjunction with the large revival in America of interest in coal-carbonization processes for gas production; and, at the time of writing, we were, as we knew many of our readers must be, aware of the application at home of automatic weighing of retort charges, particularly in connection with the De Brouwer machine. As a matter of fact, the point was principally mentioned in order to emphasize how much better it would be, for the purpose of obtaining reliable records of working, if the system of weighing was more commonly practised. However, we are pleased to have Mr. Smart's letter, in order that, among those who have not knowledge of the facts, credit for prior application may not be diverted from those who are entitled to it. There is one thing that Mr. Smart does not mention, and that is whether the weighing device stands well the rough conditions of work, and gives a good length of service in the matter of reliable registration.—ED. J.G.L.]

Mr. Tookey's Lectures on the Gas-Engine.

SIR,—I think Mr. Tookey would be performing a great service if, after a conference with a hot-water engineer, he would make some comments on the existing primitive methods adopted for cooling the water in the jackets of the cylinders of gas-engines, pointing out the defects of the systems, and suggesting a more up-to-date design for dispersing the heat, instead of storing it up in tanks.

A. LOUIS DUNPHY.

South Metropolitan Gas Company, Old Kent Road, S.E., Nov. 26, 1914.

The "S.B.G.I." and Forthcoming Exhibitions.

SIR,—With reference to Mr. H. S. Roger's letter in the "JOURNAL," I may state that the British Commercial Gas Association asked our Society for their intentions with regard to the exhibitions in question.

J. W. BROADHEAD, Chairman
Society of British Gas Industries.

Elland, Nov. 27, 1914.

A Town's Gas from Verticals.

SIR,—While not claiming to be an undertaking with an output last financial year of quite 410 million cubic feet, but being within reasonable measure of the quantity, it may not be without interest to your readers—in view of your prefatory note to the article describing the Darlington installation of vertical retorts—to know that as early as the end of April last Margate and district were satisfactorily supplied with gas made entirely by means of continuous vertical retorts, and are being so supplied at the present time.

J. M. CAMPBELL, Engineer and Manager.

Gas-Works, Margate, Nov. 27, 1914.

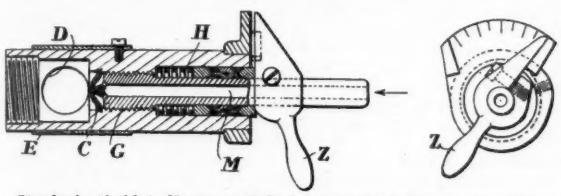
REGISTER OF PATENTS.

Nipple Regulators for Atmospheric Burners.

AUBLET, HARRY, AND CO., and STANLEY, E. J., of Peterborough.

No. 20,113; Sept. 5, 1913.

This invention relates to a fitting for regulating the amount or pressure of gas supplied to laundry machinery, hand gas-irons, and the like, or to other classes of machinery where it is required to accurately control the gas supply for heating purposes.



Stanley's (Aublet, Harry, and Co.) Atmospheric Burner Regulator.

The device comprises a helical fitting bored for attachment to the required article. C is a diaphragm dividing the body inside into two parts. D is a transverse hole through the side of the fitting near the extremity where the screw-thread is provided. E is a cylindrical sleeve having holes F corresponding with the transverse hole in the body of the fitting. This shutter is so constructed that the passage between the atmosphere and the interior of the fitting can be opened more or less. G is an internal screw-thread extending some distance from the partition C, with a plain portion H within the fitting coming beyond the screw-threaded portion. The diaphragm C has a fine conical hole in the axis of the main bore. M is a hollow spindle provided with a nozzle connecting with the gas supply pipe and formed at the other end with a circular plug having an external screw-thread corresponding with the screw-thread G within the fitting. The plug at the inner end has a somewhat conical needle point to regulate the gas passing the hole in the partition C. Perforations extend between the inside of the stem M and the outside; while metallic collars fit upon the plain portion of the spindle M in the smooth portion H of the body of the fitting. A helical spring is inserted between one collar and a step on the interior of the body A or between the other collar and the handle Z, which is provided with a pointer adapted to move over a scale at the top of the fitting.

With this construction it is claimed that, "where a screw of fine pitch is provided, a very accurate adjustment of the supply and pressure of gas passing to the burner may be obtained, and, in addition, the relative supply of air and gas may also be controlled with great accuracy."

Mixing the Constituents of a Combustible Gaseous Mixture.

IONIDES, A. C., JUN., of Porchester Terrace, W.

No. 23,350; Oct. 15, 1913.

This invention relates to the utilization of combustible gaseous mixtures (as coal gas and air), the two constituents of which are in such a proportion that, after combustion of the mixture, no substantial quantity of either constituent remains—particularly to the utilization of such mixtures in heating apparatus wherein combustion is effected according to the method set forth in patent No. 15,455 of 1909 (a crucible furnace of the type described in patent No. 2839 of 1912).

The object of the invention is to reduce the risk and effect of a backwardly propagated flame, especially in cases where a large volume of the mixture is being consumed. It consists in the application to heating apparatus of a device in which the constituents of the mixture are admixed by allowing the combustible to pass into the supporter of combustion through perforations distributed along the length of a septum between the conduits conveying the constituents, in order that the resulting mixture shall not attain its maximum strength until it reaches the point where combustion is to be effected.

The mixing device may be modified to suit the conditions under which it is to be used, or the gases to be admixed; the gas-conduit being, if preferred, surrounded by an air-conduit into which the gas is passed. Also, if desired, a suitable form of automatic valve, adapted to open when a predetermined pressure is exceeded within the device, may be provided (preferably in the inner or air pipe) as a safeguard against excessive pressure on the occurrence of a back-fire.

Production of Gas, Oil, and Ammonia.

MACLAURIN, R., of Cambusbarron, N.B.

No. 24,426; Oct. 28, 1913.

This invention, for a process of distilling coal at a low temperature (primarily by the passage of hot gases through it), has for its object "the obtaining of a considerable yield of light oils, and a higher yield of ammonia, than is obtained from ordinary carbonizing retorts."

According to the patentee, the essential features of the invention are: (1) The fuel is distilled principally by the passage through it of highly heated gases. (2) All the ammonia passing from the coal and all the oil products are steadily ascending through areas of decreasing temperature; and therefore are not liable to decomposition. (3) The oil products do not condense and run back continuously on to highly-heated fuel, but condense and run down out of the way of further danger—thus lessening the risks of the coal sticking-up with thick tar. (4) The oil is partly fractionated before the gases leave the apparatus; the upper layers of fuel being used for condensing purposes, and the condensed oils being run off at different levels. (5) The gases leaving the fuel are pretty well stripped of their heat before finally being scrubbed.

The fuel used is fed into the top chamber of a series of chambers placed one above the other, and passes down by its own weight when the producer is in proper working order. The bottom chamber is constructed similarly to an ordinary gas-producer or water-gas generator, and can be adapted for the passage of air and steam or water vapour alternately or simultaneously into the fuel in the lower chamber.

The method of working the producer depends on the quality of gas it is desired to produce. In some instances the gas that has been produced in the distilling chamber may be introduced into the lowest chamber, either alone or mixed with tar oils, alternately or simultaneously with air or steam or air and water vapour. When producer gas is being made, part of it may be passed direct from the lowest chamber through a lateral or central outlet and utilized in any way desired.

The lowest part of the producer may be so constructed, and the air or air and steam nozzles be so disposed, that part of the fuel can be completely gasified on the fire-bars below, while a useful coke can be drawn off from points above before being much acted upon by the blast.

A sufficient quantity of the hot gas produced in the lower part of the producer and containing a large percentage—at least, 14 per cent.—of hydrogen is passed up through the column of fuel extending upward from the lower gas outlet, and constituting the ammonia generating column, and through that in the upper chambers, constituting the distilling and condensing chambers, to keep the fuel at any temperature desired, and, "preferably, such that the temperature of the ammonia generating column decreases from about 700° C. at the bottom to about 500° C. at the top, from which point the temperature will still further decrease in the distilling and condensing chambers." To obtain a good yield of ammonia, the rate of combustion in the lower part of the gas-producer is so regulated that the fuel in the ammonia generating column remains in the column for several hours—say, from four to six hours. Thus the ammonia obtained can be concentrated in a comparatively small portion of gas.

The portion of the producer extending directly from the grate or bottom upwards to a certain height is the gas-producing chamber; the portion that extends from the part of this chamber where the temperature of the fuel is about 700° C. up to the part where the temperature of the fuel is about 500° C. is an ammonia generating chamber; and the portion of the producer above this chamber is the distilling or distilling and condensing chamber.

In the case of a three-chamber apparatus, the lowest chamber forms the gas and ammonia generator; the lowest part of the chamber forming the gas generator and the upper part the ammonia generator. Immediately above the ammonia generating zone the heaviest oils are distilled off by the heat of the gases passing upwards and by the heated mass of fuel below; and these oils passing up condense on the cooler fuel and the cool sides of the centre chamber, and run down into a channel or well at the bottom of the chamber, whence they can be run off. The fuel passes down through the constricted opening at the bottom of this chamber into the lower chamber as the fuel in the chamber is consumed or drawn off from it. In the upper chamber the lighter oils distil off and are similarly condensed and run down, as also does some of the water of the fuel—such lighter oils and water being cooled and run off like the heavier oils. The upper chambers, therefore, as well as providing space for heating and distilling the fuel, also serve as condensers and provide means of roughly fractionating the oil products.

Gas-Lamps.

HUMPHREY, A. H., of New York.

No. 25,317; Nov. 6, 1913. Convention date, July 18, 1913.

This invention relates particularly to gas-lamps of the indirect type or semi-indirect type—that is, gas-lamps in which the light is reflected upwardly from an opaque or semi-opaque or translucent globe closing the lower part of the lamp.

The bowl or globe is closed beneath and open at its top, and the parts are so arranged that the light rays reflected upwardly and outwardly from the inner surface of the bowl will, it is said, be practically shadowless. Further, the operating parts are so arranged as to be entirely out of the path of the products of combustion, which escape without unduly heating any portion of the lamp, and at the same time do not interfere with the air supply to the burner, "the air being

effectively delivered to the mixing-tube and to the burner at the point of combustion."

The invention is not further described except with reference to three sheets of lettered drawings illustrating one form of construction.

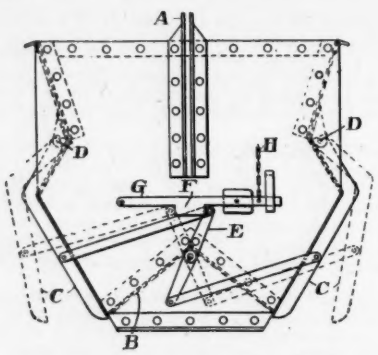
Skips for Conveying and Discharging Coal, Coke, &c.

ROBERT DEMPSTER AND SONS, and MITTON, W., of Elland.

No. 28,117; Dec. 6, 1913.

This invention relates to skips the outlet doors of which are adapted to be closed by gravity, and to be opened by the weight of the material carried.

The skip is shaped like a vase, of rectangular plan, with doors conforming to this shape. The point of suspension of each door is therefore inside the plane of the door, and preferably about vertically over the centre of gravity of the door when the skip is empty and the door closed. When the skip is loaded, the weight of the material pressing on the inclined inner surface of the door tends to open it on the release of the catch; the first motion of the door and coke in contact with it having a downward trend, which reduces to a minimum the friction between the door and the outflowing coke. When the doors are fully opened another part of the catch comes into operation and keeps them open.



Mitton's (R. Dempster and Sons) Coal and Coke Skip.

The body of the skip is suspended by chains attached to angle irons A. It has a bottom of plates B, with a doubled slope as indicated in dotted lines. The doors C are pivoted or hinged at D, and linked at each end to a rocking lever E, which, at the end of the skip shown, normally engages a stop F on a pivoted bar, handle, or locking arm G, on which a weight is adjustable. When the skip is filled and it is desired to discharge its contents, the arm G is lifted (say) by a chain H —until the stop F clears the lever E. In consequence of the pressure of the material carried against the inner surfaces of the doors and the weight of the coke supported by the doors, they fly open, rocking the lever E into the position shown in dotted lines. The arm G being then allowed to descend, the other end of the stop F engages the other side of the lever E and keeps the doors open, so as not to impede the free discharge of the contents. The arm being then lifted, the doors fall into their closed positions, returning the lever. The handle being again lowered, this locks the lever with the doors shut.

APPLICATIONS FOR LETTERS PATENT.

22,580.—CUTLER, E. E., "Concrete gas-tanks." Nov. 16.

22,590.—JACKSON, C. L. H., and GEORGE ABBOTT, LIMITED, "Geyser." Nov. 16.

22,652.—STOTT, V. H., and SCHOFIELD, L., "Geysers." Nov. 17.

22,687.—MARSH, R. G., and WALTER, C. M., "Measuring or regulating the flow of gases or indicating or recording changes of pressure or temperature." Nov. 18.

22,750.—ROSE, A., BELLAMY, W., and DOLPHIN, J., "Controlling the gas supply to groups of burners." Nov. 19.

22,762.—KEITH, J. & G., "Gas-burners." Nov. 19.

22,769.—JOHNSTON, J., and the GLOBE PNEUMATIC ENGINEERING COMPANY, LIMITED, "Rotary compressor or exhauster." Nov. 19.

22,847.—PICKARD, W., and BENTLEY, J. E., "Regulating the supply of gas to burners." Nov. 21.

Infirmary Lighting in Birmingham.—In spite of the contention of several members that "the greatest economy should be practised during the war," the Birmingham Board of Guardians have authorized the raising of £7600 for the electric lighting of Dudley Road Infirmary and Western Road House. At present the cost of making gas at their private works is £1790 per annum, exclusive of mantles, burners, &c., as compared with £1477 for Corporation gas. For electric lighting the cost of current from the Corporation mains is estimated at £926 per annum for the two Institutions; and during the fifteen years of loan repayment there will be about £680 a year to add to this. Thus for fifteen years the cost will be £129 per annum more than by using Corporation gas; while subsequently it should be £551 a year less. The recommendations adopted included one that gas from the Corporation should be obtained for cooking, and that no further expenditure should be incurred in repairing the private gas-works other than for temporary use. These works are, it is said, quite worn out; while considerable leakage has occurred in the infirmary through the pipes also being faulty.

PARLIAMENTARY INTELLIGENCE.

NOTICES GIVEN FOR BILLS (SESSION 1915) RELATING TO GAS, ELECTRICITY, AND WATER SUPPLY.

Altrincham Gas.—The Altrincham Gas Company will apply for power to raise additional capital, to appoint a managing-director, whose duties and remuneration are to be fixed by the Board, and to create and maintain reserve and special purposes funds. It is proposed to supply gas according to its calorific and not its illuminating value; and the projected Bill will contain provisions in regard to testing the gas for this value and the imposition of penalties for deficiency. Some of the general powers sought refer to the laying of new pipes and culverts for oil and residual products, the materials, &c., of service-pipes, and the fixing of a minimum payment for gas used as a stand-by.

Ammanford Urban District Council.—A General Powers Bill for which notice has been given by the Ammanford Urban District Council will contain some provisions in regard to the supply of water. They refer, among other things, to the repair by the Council, in certain cases, of communication-pipes, and the recovery from the owner of the cost of so doing; the charge to be made for water for washing stables, horses, carriages, and motor vehicles; and the fixing of meters for preventing and detecting waste.

Ascot District Gas and Electricity.—The Ascot District Gas and Electricity Company will apply for authority to supply power gas, substitute a standard calorific power for the existing prescribed illuminating power, amend their obligations in regard to the supply of gas, and make provision for the establishment of a co-partnership or profit-sharing scheme and the granting of superannuation and other allowances. The Company wish to be empowered to take a supply of energy in bulk, raise additional capital, and make special provisions in respect of its issue.

Ashington District Council.—The Ashington Urban District Council desire authority to construct additional water-works, consisting of a service reservoir in the parish of Cockle Park and six aqueducts, to acquire waters and springs, and to make general provisions in regard to the supply of water within limits to be defined. It is proposed to apply to the existing water undertaking of the Council the provisions of the Act for which notice has been given.

Barnoldswick Water.—The Urban District Council of Barnoldswick seek authority to construct additional water-works, consisting of two reservoirs, two aqueducts, a catchwater, and a road diversion; to acquire lands for the protection of their water supply from depletion, pollution, and contamination; and to define the water limits. It is proposed to apply the intended Act to the existing water undertaking of the Council. Borrowing powers will be asked for.

Brighton and Hove Gas.—Application will be made by the Brighton and Hove Gas Company for authority to extend their limits of supply so as to include the parishes of Botolphs and Coombes, in the rural district of Steyning West, in the county of West Sussex, and to purchase gas in bulk. The Company seek power to subscribe or give donations to "any fund raised in any national emergency," or to infirmaries, hospitals, convalescent homes, exhibitions, or other institutions, or to benevolent or sick funds of the employees; and also to grant pensions, &c., to officers and servants. In the Bill to be promoted, provision will be made for the payment of gratuities, pensions, or allowances to employees "disabled, injured, or wholly or partially incapacitated while serving with the forces engaged in war, or to the widow, family, or dependants of any such employee killed in action or dying of wounds or disease received or contracted in the war."

Bury and District Joint Water Board.—The Board want an extension of time for the compulsory purchase of lands and the completion of works authorized by the Board's Act of 1903; also additional borrowing powers.

Chelmsford Corporation Gas.—The Corporation of Chelmsford have notified their intention of applying for authority to acquire, compulsorily or by agreement, the undertaking of the Chelmsford Gas Company, in accordance with the decision come to some months ago. The Company will be wound up, and all their existing powers transferred to the Corporation. The provisions of the Bill to be promoted will refer (*inter alia*) to the testing of gas for its calorific value, the abolition of the illuminating power test, and the sale of portions of the gas-works, &c., beyond the borough limits. Authority to borrow money will be sought.

Dewsbury Corporation.—The Corporation of Dewsbury will apply for an extension of their limits for the supply of gas so as to include the urban districts of Emley, Flockton, and Whitley Upper, in the West Riding of the county of York; also for authority to subsitute a calorific standard for the present prescribed illuminating power, and make further general provisions in regard to gas supply, including its sale in a crude or partially purified state to any company or person.

Doncaster Corporation.—Application will be made by the Doncaster Corporation for the repeal of the statutory provisions affecting the illuminating power of the gas supplied by them, and the substitution therefor of a calorific standard. Further powers are required in regard to the gas undertaking; and the Corporation wish to be freed from the obligation to afford supplies of gas which they consider would interfere with their general supply, or in such other cases as may be provided. It is proposed to extend the gas limits so as to include four parishes in the rural district of Doncaster, and to construct additional works adjoining those now existing. Borrowing powers will be applied for.

Frimley and Farnborough Water.—The Frimley and Farnborough District Water Company seek authority to increase the quantity of water pumped from the well at Odiham, and to construct works (other than wells) on lands already or to be acquired. Provision will be made in regard to the supply of water to any local or other autho-

rity wholly or partly within the Company's limits. Further capital and borrowing powers will be applied for.

Ilfracombe Gas.—Some important additional powers will be applied for next session by the Ilfracombe Gas Company. They wish for authority to substitute the calorific for the illuminating power test, adopt a standard price with a sliding-scale, produce and supply electricity in the parish of Combe Martin, and construct a generating station and ancillary works. Other matters in the notice relate to the formation of reserve and special purposes funds, the appointment, dismissal, and remuneration of officers, the establishment of a scheme of profit-sharing, &c. Additional borrowing powers will be asked for.

Lincoln Corporation.—In a General Powers Bill for which notice has been given by the Lincoln Corporation, they will seek power for the purchase of land for the extension of the electricity generating station, and make provision in regard to the supply of electricity and gas. It is proposed to extend the gas limits so as to include the parishes of Bracebridge Heath, North Hykeham, and Waddington, in the rural district of Branston, in the county of Lincoln. With regard to water, the Corporation wish to be authorized to charge for that which is supplied by meter, whether within or beyond the city, a minimum sum based upon the rateable value of the premises supplied. Additional borrowing powers will be sought.

London and District Electricity Supply.—The London County Council will apply for parliamentary sanction to the establishment of an authority for the supply of electricity in London and the adjoining districts, on the lines which have been indicated in the "JOURNAL." It is proposed that the authority shall carry out the powers conferred upon it in conjunction with a company or companies. Separate notices have been given for two of these—one to exercise any powers with regard to the supply of electricity in or near London which may be conferred upon the London County Council or other public authority; and the other for the supply of electrical energy for all purposes in an area comprising the Administrative County of London and portions of the neighbouring counties. It is proposed that this Company shall acquire the undertakings of specified electricity supply companies; payment to be made in securities of the new Company, which holders in the transferred undertakings must accept. There will be a sliding-scale of price and dividend.

Lurgan Gas and Water.—The Lurgan Urban District Council have decided to apply for authority to supply gas and acquire the undertaking of the Lurgan Gas and Chemical Company, Limited, also to make provision for affording a better water supply, and other purposes. Borrowing powers will be required.

Metropolitan Water Board.—Application will be made by the Board for authority to construct additional works in London, Middlesex, Kent, and Surrey. They consist of six reservoirs, eight aqueducts or pipe-lines, a well and pumping-station, and a subway or tunnel; also to make a footpath at Walton-on-Thames. The Board ask for further powers in regard to the recovery of rates and charges and the removal of meters and apparatus; and provision will be made in the Bill for the cost of reconnecting supplies cut off by the Board being paid by the consumers. Authority is sought to increase the amount of the Board's bills and to raise more money.

Northwich Gas.—The Northwich Gas Company are desirous of converting and consolidating their capital, raising more money, and extending their limits of supply so as to include the parish of Weaverham, in the rural district of Northwich. The limits under the Company's Act of 1882 are to be defined by reference to the existing local areas. It is proposed to ask for authority to acquire certain lands in the urban district of Northwich, and construct new gas-works, adopt a standard price with a sliding-scale, substitute a calorific for the illuminating power test, establish a profit-sharing scheme, and grant superannuation and other allowances.

Ormskirk Gas and Electricity.—The Ormskirk Gas Company are seeking power to extend their limits of supply so as to include the parish of Parbold, in the rural district of Wigan, acquire lands, construct new and maintain the existing gas-works, substitute the calorific for the illuminating power test, and obtain relief from the sulphur restrictions. Authority is required to produce, store, and supply electricity throughout the parish of Aughton, in the rural district of West Lancashire, construct a generation station and works, and lay down the necessary lines, &c., for furnishing such supply; also to acquire the electricity undertakings of local authorities and others. It is proposed to give the West Lancashire Rural District Council power to purchase the electricity undertaking of the Company, whose name is to be changed. The provisions of the Bill to be promoted will include the granting of superannuation allowances, profit-sharing, the appointment of a managing-director, the appointment, dismissal, and remuneration of the secretary, officers, and servants, and the raising of additional capital in respect of the supply of both gas and electricity.

Plymouth Corporation.—Application will be made by the Plymouth Corporation for the consolidation, amendment, and repeal of certain Acts and Orders, and the re-enactment and application to the whole borough of existing Acts, with amendments. Authority will be sought to continue and maintain the gas and water undertakings; and the Bill to be promoted will contain further provisions in regard to both. As to the former, they will apply (*inter alia*) to the illuminating power, pressure, quality, and price of gas, the breaking-up of streets, the size and material of pipes and fittings, the sale of gas in bulk outside the limits, and the conditions for its supply to certain Government Departments. The Corporation require authority to extend their limits of water supply so as to include a number of parishes in the county of Devon. Additional borrowing powers will be applied for.

Prescot Gas.—The Prescot Gas Company intend to apply for authority to consolidate and convert their existing capital, raise more, and increase their borrowing powers. The Bill to be promoted will contain provisions for the substitution of the calorific value for the illuminating power test of gas, and for the relief of the Company from existing obligations and penalties; also in regard to the construction and placing by the consumer of pipes, &c., between the main and the meter, and other matters connected therewith.

Rhondda Urban District Council.—A Bill to be promoted by the Council mainly to sanction extensions of tramways will contain provisions in regard to the gas and water undertakings of the Council. The former include the pressure and testing of gas and its sale to persons having a separate supply of gas or electricity; and the latter relate chiefly to the repair and maintenance of pipes, and the charges to be made for water for washing horses, carriages, and motor-cars.

Sheffield Corporation (Derwent Valley Water).—The Sheffield Corporation intend to apply for an amendment of section 85 of the Derwent Valley Water Act, 1899, with respect to the apportionment of the expenses of the Derwent Valley Water Board, and for the setting aside of any award or other proceeding so as to give effect to such amendment.

Skegness Gas.—Authority will be sought by the Skegness Urban District Council to supply gas, and acquire the undertaking of the Skegness Gas Company, whose powers would be transferred to the Council. The latter wish to be empowered (*inter alia*) to provide apparatus for testing the calorific value of the gas, prescribe a standard for it, and provide also for testing the illuminating quality of the gas. Borrowing powers will be applied for.

Smethwick Corporation.—A number of provisions in regard to the supply of gas will be contained in a General Powers Bill for which notice has been given by the Smethwick Corporation. They refer, among others, to the following subjects: Substitution of a calorific power for an illuminating power test of gas; high-pressure gas, and amendment of the Sale of Gas Act, 1859; minimum charge for gas; removal of restrictions as to sulphur; sale of coke.

Southend Water.—The Southend Water Company seek authority to construct seven pumping-stations and a tunnel, acquire lands, springs, and waters, and make provision in regard to the supply of water, fittings, meters, &c. Additional capital and borrowing powers will be required, as well as permission to declare interim dividends without calling a meeting of shareholders.

South Staffordshire Water.—The South Staffordshire Water Company intend to apply for authority to enlarge their limits of supply so as to include several parishes in the rural district of Cannock, in the county of Stafford, and to construct new works, consisting of two wells and pumping-stations and two pipe-lines. Additional capital will be asked for; and the Bill to be promoted will contain provisions as to this capital and that already authorized, as well as to the debenture stock.

Spennymoor and Tudhoe Gas.—Application will be made by the Spennymoor and Tudhoe Gas Company for authority to use certain lands for the manufacture of gas and the conversion, &c., of residual products and other purposes, substitute the calorific for the illuminating power test of gas, and adopt a standard price with a sliding-scale. Other matters included in the application are the payment of pensions and allowances to officers and servants, contributions to charitable institutions, the creation of a special purposes fund, and remuneration of the secretary. Additional capital will be sought.

Sunderland Corporation.—The Corporation of Sunderland will apply for authority to reconstruct, widen, and improve Wearmouth Bridge and the approaches thereto; and the Bill to be promoted will seek power to make special provisions with regard to gas and water mains and electricity conduits, and require the diversion thereof, at the owners' expense, either to the sides of the bridge as reconstructed, or to such other position as may be directed; to prohibit the breaking-up of the roadways or footpaths of the bridge; and to regulate the placing of mains, pipes, wires, and other works, across it.

Sutton District Water.—The Sutton District Water Company desire authority to construct additional works, consisting of a well or wells and pumping-station in the parish of Cheam, and a conduit or pipe-line therefrom to a service reservoir to be built in the parish. They also want power to repair communication-pipes and to recover the expenses incurred in so doing. More capital will be applied for.

Warwick Gas.—The Warwick Gas Company are applying for the repeal or amendment of their Act of Incorporation, and the continuation of the Company incorporated under their present or some other name, with all their works, rights, and powers. Authority is asked to extend the limits of supply so as to include the borough of Warwick and a number of parishes in the rural districts of Warwick and Stratford-on-Avon; but provision will be made for the exclusion, if thought fit, of some of these places, and for the definition of the limits under the Company's Act of 1822 by reference to the existing local areas. The present gas-works are to be extended, new ones erected, and those of the Barford Gas Company purchased. The existing capital is to be consolidated and converted; the money expended on works is to be capitalized; and additional capital and borrowing powers will be applied for. The Bill to be promoted will include provisions as to the price, quality, pressure, and testing of gas, the establishment of a profit-sharing scheme, and the granting of superannuation and other allowances.

Weardale and Consett Water.—The Weardale and Consett Water Company will apply for a revival of the powers conferred upon them by their Act of 1902 for the construction of a reservoir, a tramroad, and other works, for confirmation of the existing works, and for authority to construct new ones, consisting of a pumping-station, a service-tank, a break-pressure tank, three intakes, and a number of pipe-lines. The Company desire the application and alteration or repeal of certain portions of the above-named Act in regard to compensation water. The Bill to be promoted will contain further provisions in regard to the supply of water.

West Gloucestershire Water.—The West Gloucestershire Water Company wish to amend their existing capital powers, and raise more money. They also seek authority to pay interest out of capital.

Wolverhampton Water.—The Corporation of Wolverhampton seek authority to construct water-works in the counties of Stafford and Salop. They comprise a pumping-station, a service reservoir, and two aqueducts or pipe-lines. The Bill to be applied for will contain provisions for securing the purity of the water and for its sale in bulk. It is proposed to extend the limits of supply so as to include certain parishes or townships in the rural district of Cannock and elsewhere in the county of Stafford, and two others in the rural

district of Shifnal, in the county of Salop. Borrowing powers will be asked for.

Yorkshire Electric Power.—The Yorkshire Electric Power Company intend to apply for the removal of the existing restrictions with respect to the supply of energy for lighting purposes, and for authority to furnish such supply in a number of urban and rural districts in the West Riding of the county of York, and prescribe the price to be charged therefor.

PROVISIONAL ORDER APPLICATIONS (SESSION 1915).

Board of Trade, under the Gas and Water Works Facilities Act, 1870.

Cheadle Gas.—Power will be sought by the Cheadle Gas Company to maintain and continue their works and conduct their gas undertaking. Provision will be included in the Order in regard to the price, quality, pressure, and testing of gas, its sale in bulk, the supply of fittings and apparatus, and the erection of dwelling-houses for the employees.

Ely Electric Lighting.—The Ely Gas and Electricity Company, Limited, seek authority to produce, store, and supply electricity within the urban district of Ely, construct works for the purpose, and levy rates and charges. An increase of capital and borrowing powers will be applied for.

Fisherton Anger and Bemerton Water.—Application will be made by the Fisherton Anger and Bemerton Water Company for authority to increase their capital by the issue of fully-paid £1 shares.

Guildford Gas.—The Guildford Gas Company intend to apply for an extension of their limits of supply so as to comprise the borough of Guildford and several parishes in the rural districts of Guildford and Hambledon, in the county of Surrey. Further provision is to be made with respect to the quality of the Company's gas; and their Act of 1896 is to be amended accordingly. Authority will be sought for the determination of the Secretary's remuneration by the Directors, for the amalgamation of the Company with the Godalming Gas Company, and for changing the name of the Woking Water and Gas Company. Additional capital will be required.

Heathfield and Waldron Gas.—The Heathfield and Waldron Gas Company wish for authority to maintain and continue their works at Heathfield, and supply gas in the above-named parishes. Provision will be made in the Order in regard to the quality and pressure of gas, the substitution of the calorific for the illuminating power test, the adoption of a standard price with a sliding-scale of dividend, and the sale of gas in bulk.

Hoylake and West Kirby Gas and Water.—The Hoylake and West Kirby Gas and Water Company, Limited, will apply for authority to acquire additional lands for the erection of gas-works and to raise more capital. The Order will contain provisions in regard to the testing of gas, its supply in bulk, and the levying of an extra charge for water used for washing horses, carriages, and motor-cars.

Liverpool Gas.—Application will be made by the Liverpool Gas Company, under the powers conferred upon them by their Act of last session [noticed in the "JOURNAL" for Oct. 15, p. 73], for authority to include Fazakerly in their limits of supply, and to acquire the gas undertaking of the Liverpool Corporation, whose powers in respect thereof will be repealed. The terms of transfer are to be as agreed upon between the parties, or as may be settled by arbitration or determined by the Order to be applied for. Authority will be sought to erect gas and residual products works, and to apply for the purposes of the Order any money the Company have raised or have power to raise under their Acts.

Melton Mowbray Gas.—The Melton Mowbray Gas Company, Limited, are desirous of extending their limits of supply so as to include a number of parishes in the county of Leicester. The standard price of gas is to be fixed, and provision will be made for varying it in portions of the limits. Additional capital and borrowing powers will be asked for.

Mid-Kent Gas.—Power will be sought by the Mid-Kent Gaslight and Coke Company to raise the unissued capital by preference shares or stock, and to obtain additional capital.

Oakham Gas.—The Oakham Gas Company, Limited, wish to extend their limits of supply so as to comprise the urban district of Oakham, several parishes in the rural district, and a portion of the parish of Burley. The general provisions of the Order to be applied for will include some relating to the testing, quality, and pressure of gas, and the burner and other instruments to be employed for the purpose; also to the reduction of the standard illuminating power of the gas. Additional capital and borrowing powers will be applied for.

Rothwell Gas.—The Rothwell Gas Company seek authority to raise additional capital to the amount of £16,000, in £10 shares, and to borrow proportionate sums in respect of the new capital.

Staveley Gas.—The Staveley Gas Company want an extension of their limits of supply so as to include the parish of Barlborough, in the county of Derby, and authority to raise additional capital. The Order will contain provisions in regard to the price to be charged for gas within the new limits of supply

Swanage Gas.—Authority will be sought by the Swanage Gas Company to cancel the water capital authorized by the Swanage Gas and Water Act of 1901, repeal the provisions of the Company's Acts of 1901 and 1912 so far as they relate to the water capital and the borrowing powers in respect thereof, provide for the distribution of the assets of the water undertaking of the Company, and define the capital.

Thirsk District Water.—The Thirsk District Water Company, Limited, wish for authority to extend their limits of supply so as to include the townships or parishes of Kepwick, Cowesby, and Kirby Knowle, in the rural district of Thirsk, in the North Riding of the county of York; also to construct additional works, consisting of a receiving chamber at Kepwick and an aqueduct connecting it with Felixkirk. The Company want additional capital and borrowing powers.

Thirsk Gas.—Authority is applied for by the Thirsk Gas Company to construct new works and raise additional capital. The Order will contain provisions relating to the testing, quality, and pressure of gas, and the burner and other instruments to be employed for testing purposes.

Secretary for Scotland under the Private Legislation Procedure (Scotland) Act, 1899.

Clackmannan County (Alloa) and Tillicoultry Water.—The County Council of Clackmannan will apply for authority to construct works, for the supply of the Alloa and Tillicoultry special district with water, which is to be drawn from the Loss or Craigencash Burn and the Inchna Burn No. 2. The new works will form part of the existing water undertaking. General powers with regard to water supply will be applied for, as well as permission to raise more money.

Cowdenbeath and District Gas.—Application will be made by the Cowdenbeath Gas Company, Limited, for authority to dissolve and reincorporate. The undertaking is to be transferred to the new Company, and the existing works maintained and extended. The Order will contain provisions in regard to the quality and pressure of gas, the means and methods of testing it, and the price or prices to be charged for it. Provision will also be made as to the calorific value of the gas supplied by the Company; and it is proposed that certain sections of the Gas-Works Clauses Act, 1871, shall, as applied to the Company, be construed as if calorific value were referred to in lieu of illuminating power. Other provisions will relate to the regulation of pipes and fittings, the supply of gas in bulk, and the formation of reserve and special purposes funds. Additional capital and borrowing powers will be applied for.

Forfar Gas.—The Corporation of Forfar desire authority to raise additional capital, and make further provision in regard to the quality, pressure, and testing of gas. It is proposed to lower the present standard of illuminating power. Other matters to be dealt with in the Order are the erection of dwellings for employees, and the granting of allowances and pensions for those who are aged or disabled, or their dependants.

Glasgow Corporation Gas.—In an Order for which notice has been given by the Glasgow Corporation to authorize the carrying-out of various works, they will apply for power to make, use, and maintain a bridge over Adelphi Street, commencing in the Dalmarnock Gas-Works, on the south side, and terminating in the gas-works on the north side of the street. The bridge is to form part of the gas undertaking; and the provisions of the Glasgow Gas Acts of 1910 and 1912 are to apply to it as if it had been constructed under the powers of these Acts.

Glasgow Corporation Water.—The Corporation of Glasgow ask for authority to construct additional water-works, consisting of an impounding reservoir on the River Turk and an aqueduct for conveying the water therefrom to Loch Katrine; also two railways, a new road, and an alteration in the level of one already existing. It is proposed to abstract water from the river and from Finglas Water. Power will be sought to acquire lands for the protection of the water-works, and to plant with trees any land in the Corporation's possession which may be considered suitable for afforestation.

Irvine and District Water Board.—Authority will be sought by the Irvine and District Water Board for the construction of additional works, consisting of a reservoir, a catchwater, an embankment across the Drum Burn, an aqueduct, and an access road, all in the county of Ayr. It is proposed to impound the waters of the Caaf Water and the Drum Burn and their effluents. In another Order the Board will apply for authority to construct a conduit or pipe-line in the parishes of Dalry and Largs, and to make agreements with the Corporation of Paisley and others for the supply of water in bulk. The proposed conduit is for the use of Nobel's Explosives Company, Limited, who will bear the cost: but provision will be made for the repayment to them by the Board of some of their outlay. Borrowing powers will be required in the case of each application.

Lanarkshire County Council (Gas and Water).—The Council intend to apply for authority for a District Committee of their body to combine, for the purposes of gas supply, two or more special lighting districts or other areas within which the Burghs Gas Supply (Scotland) Act, 1876, has been or may be adopted by a District Committee. The Council will ask for further powers in relation to the borrowing of money for the purpose of the supply of gas in the combined areas, and for the establishment of gas-works; and it is proposed that they and the Committee shall have all the necessary authority for giving effect to the objects of the Order in regard to gas supply. The Council will also apply for power to be conferred upon the District Committee of the Middle Ward to construct, in connection with the water undertaking, a service reservoir in the parish of Cumbernauld, eight aqueducts or pipe-lines, and a railway. It is proposed to apply for an extension of the limits of supply so as to include portions of the parishes of Cumbernauld and Kirkintilloch, and for authority to make agreements with the Dumbartonshire County Council in relation thereto.

Port Glasgow Gas.—Authority will be applied for by the Port Glasgow Corporation to construct new works for the manufacture, storage, and supply of gas and the manufacture of residual products, and to supply the burgh and district with gas. The Order to be sought for will contain provisions in regard to the following matters: Extension of the limits of supply, sale of the existing gas-works and lands acquired for gas-works purposes, supply of gas in bulk, adoption of calorific standard, repeal or amendment of the obligations respecting illuminating power, and the manufacture, &c., of gas-fittings. Additional borrowing powers will be included.

Gas Consumption at Lancaster.—The comparative statement for the past six months submitted to the Lancaster Corporation Gas Committee by the Engineer (Mr. C. R. Armitage) shows that 82,796,875 cubic feet of gas were consumed, a net decrease of 6,339,943 cubic feet, because the meters were read fifteen days earlier. The total income was £12,035, against £14,832. It has been decided to supply gas free to the houses occupied by Belgian refugees.

LEGAL INTELLIGENCE.

IMPORTANT RATING APPEAL AT PRESTON.

Preston Gas Company v. The Assessment Committee of the Preston Union.

At a Special Sitting of the Preston Quarter Sessions commencing on Monday of last week, an appeal by the Preston Gas Company against the Assessment Committee of the Preston Union was heard. The case came before Mr. H. W. WORSLEY-TAYLOR, K.C., the Recorder, who was accompanied on the Bench by several Justices.

Mr. E. SUTTON and Mr. H. P. GLOVER (instructed by Messrs. J. Clarke and Son) appeared for the respondents; and Mr. J. H. BALFOUR BROWNE, K.C., Mr. GORDON HEWART, K.C., M.P., and Mr. G. PARKER (instructed by Messrs. Forshaw, Parker, and Co.) appeared for the appellants.

Mr. SUTTON, in opening the proceedings, said that he appeared on behalf of the Assessment Committee of the Preston Union and the Overseers of Preston. No doubt they were aware that there had been a great number of appeals made by the Preston Gas Company in regard to other parishes within the Preston Union; and, as originally framed, these would have involved many difficult questions of law, and an exhaustive inquiry into the productive and non-productive parts of the undertaking of the Company, and also with regard to the apportionment of the rateable value, whatever they might ascertain it to be, between the different parishes in the Union. There had, however, been certain agreements come to which would overcome many of the difficulties, and curtail the time to be occupied by the appeal. They could obviate a great deal by not dealing more than was necessary with the productive and non-productive part of the works; but one part of the agreement was that the undertaking of the Company should be valued as though it all lay in one parish, excepting a small outlying district which was in Chorley. This greatly limited the scope of the inquiry, and rendered it unnecessary to say how the rates should be apportioned after the amount had been ascertained. He did not wish to go into the whole history of the Preston Gas Company; but it appeared that for a considerable number of years the rating of the undertaking had been practically stationary, until recent years. In fact, it was in 1911 when an Act of Parliament was passed confirming a Provisional Order of the Local Government Board. About this time one thing was brought to the knowledge of the Assessment Committee, and that was the partial discontinuance of the Glover Street works; and certain allowances and reductions were made to the Company in respect of this. For some years it would appear that the Company was a little sleepy, though since 1912 it had been conducted on very careful lines, and had been remarkably prosperous.

Mr. BALFOUR BROWNE asked the year Mr. Sutton intended to base his figures upon for ratable purposes, because it made a lot of difference. He did not see how he was going to get a basis as between the hypothetical tenant and the hypothetical landlord and the Company's hypothetical customers. For instance, 1912 was an exceedingly good year. Therefore, it was of importance as to how they established a satisfactory basis to work upon.

The CHAIRMAN (Mr. Worsley-Taylor): I understood that it was proposed to work on the 1913 year as a basis, and that this had been consented to.

Mr. BALFOUR BROWNE: I am not going to regard any balance-sheet as conclusive evidence.

The CHAIRMAN: We must work upon a set of figures as a basis.

Mr. BALFOUR BROWNE: Yes; I quite agree.

Mr. SUTTON: In taking into consideration the rateable value of an undertaking the financial position of the Company is of importance; and it is evident the Preston Gas Company is a very old-established one—in fact, I believe it was established as long ago as 1815.

Mr. BALFOUR BROWNE: It was incorporated by Statute in 1839.

Mr. SUTTON then went on to refer to a number of Acts of Parliament which had been introduced affecting gas companies, especially those of 1879, 1894, and 1911. The last gave to gas companies certain powers, one of which was that they were able to reduce the quality of the gas which they were bound to supply—they were able to produce a 14-candle power instead of an 15-candle power gas. Advantage had been taken of these provisions.

Mr. BALFOUR BROWNE: We have also reduced our price.

Mr. SUTTON said that, at all events, the Act must have been of considerable benefit to the Preston and other gas companies—in fact, the Preston Company had obtained such a return upon their undertaking that they had been able to create a sinking fund, and, in addition to the dividends paid, had been able to set aside considerable sums to meet contingencies. The Company did not seem to have taken up the idea of supplying slot-meters till the 1911 Act came into operation; and no doubt a question would be raised that would bring a considerable amount of discussion as to what legitimate effects this would have upon the rateable value of the undertaking. There was also the question as to whether the cost of prepayment meters was to be a charge upon the Company, or a charge on tenant's capital. He was inclined to think that probably it would be found that it was to be a charge upon the hypothetical tenant, and to increase the tenant's share of the profits in the concern. On the other hand, if the Company in their judgment chose to import a large quantity of capital in the purchase of prepayment meters that had not been essential or in excess of what was required, it could not form part of the tenant's capital for rating purposes, for the tenant's capital must be considered only from the point of meeting expenditure in the expenditure of the year in question. He contended that the expenditure regarding the meters should be calculated on the basis of those which had actually been fixed. There were two things the Court would have to find out—what was the amount of the hypothetical tenant's capital and what percentage should be paid on it—what was the proper sum to contribute in regard to repairs and renewals.

The CHAIRMAN: What has this hypothetical tenant spent on these penny-in-the-slot meters?

Mr. SUTTON: At the rate of £8000 or thereabouts, although they have laid out altogether about £30,000.

The CHAIRMAN: In the purchase of them?

Mr. SUTTON: Yes; but the whole of this cannot be considered the tenant's capital. It is as near as possible to £8000; but we allow a margin of 5 per cent. above the actual cost.

Mr. SUTTON went on to point out that the Company was limited as to the amount of dividends paid: and in this respect it was different from some companies. They would see this when they came to the amount of capital that had been raised at different times—they were able to sell their shares at a large premium. This gave the Company the character of a fixed investment. There was very little risk; and a man would therefore be content to receive a less return than one who was placing his capital in a hazardous concern. He suggested that a return of 12½ per cent. upon the tenant's capital would be very reasonable remuneration.

In reply to the Chairman, Mr. SUTTON said that the appeal was against the present assessment for the whole undertaking in respect of six townships of £28,666 gross and £15,236 rateable, and in respect of the Borough of Preston alone of £26,987 gross and £14,000 rateable. There had been laid out by the Company on their new works at Moor Lane a sum of £20,000, out of which £5000 was taken from revenue. He also enumerated many other items which had been directed to a similar purpose; and he subsequently quoted from Justice Channell, in the King's Bench Division, to the effect that 12½ per cent. was a fair return to make on the rateable hereditament, and that 17½ per cent. was too much.

Mr. BALFOUR BROWNE suggested that Justice Channell's remarks had hardly been correctly interpreted, and quoted some figures given by Mr. Sutton, which he contended were wrong, and that the Assessment Committee could not succeed.

Mr. *Herbert W. Fuller*, of London, then gave evidence. He said that in September, 1912, he was appointed to make a re-valuation of the gas undertaking at Preston. At that time the Company's undertaking stood at £13,145 gross and £11,869 net. His valuation, based on the 1911 accounts, was £28,666 gross, £17,968 net. He was not allowed to see the accounts in detail, and was refused certain information about the Glover Street works.

Mr. GLOVER: Are you able to say that the Company have paid maximum dividends?

Witness: Except one half year.

In reply to Mr. BALFOUR BROWNE, Counsel said that he ought to have said statutory dividend.

Witness, in reply to further questions, said he did not consider the Company's policy a progressive one prior to 1912. They had progressed since they had slot meters and cookers. The progressive policy was indicated in the accounts by the increased sales of gas. The increase in 1912-1913 was at the rate of one-eighth. His valuation was based on the 1911 accounts.

Mr. GLOVER: Was 1911 or the subsequent year more favourable?

Witness: The year 1911 was the more favourable one to the Company; for the sale of gas in that year was the lowest since 1906. If the valuation had been made on the 1913-14 accounts, the gross and the rateable value would have been increased. An objection having been laid against this assessment, he was again consulted by the Assessment Committee, and increased the amount of the statutables to be deducted from the gross from £10,698 to £13,430, bringing the rateable value down to £15,236.

Mr. BALFOUR BROWNE contended that the Assessment Committee were wrong, because there was an appeal against the gross and the net. The Assessment Committee had full power to alter it; and what his friend was then doing was to prove that the Assessment Committee were wrong.

Mr. SUTTON: They cannot reduce the gross.

Mr. BALFOUR BROWNE: They cannot raise it. But they can reduce the gross; and that is the whole point.

Mr. SUTTON: It is not the whole point. The Assessment Committee did not choose to reduce the gross; but they could not legally do so.

Mr. BALFOUR BROWNE: I submit that they have full power to reduce it to any figure if they choose. They put too high a figure on the statutables.

Witness, in reply to Mr. BALFOUR BROWNE, said that the Assessment Committee could not increase the gross, but they ought to be able to do so.

Mr. SUTTON: In 1913 there was an expenditure of £33,000 in respect of prepayment meters.

Witness: Yes; altogether a total expenditure of £33,081.

Mr. SUTTON: In 1912 meter-rents were £600 more than in 1911?

Mr. BALFOUR BROWNE: It is not £600, it is only £60.

Mr. GLOVER: Did the receipts from sales of gas in 1913 show an increase of £8000 over 1912?

Witness: Yes.

Mr. GLOVER: And the receipts for residuals £3570 for 1912?

Witness: Yes.

Mr. GLOVER: Was there also a considerable outlay on mains?

Witness: Yes; and not shown in the capital account, but debited to revenue.

Mr. GLOVER: What you really say is that during a certain period £20,000 was expended on the Moor Lane works?

Witness: Yes.

Mr. GLOVER: Then, of course, there is the item regarding residuals.

Witness went on to explain that the Company should be assessed on £102,000 instead of £82,000. In making his calculation he took the average for the last seven or eight years, and that gas cost 1·15d.; but Mr. Tagg, at a Board of Trade inquiry, in 1911, said that 1d. was sufficient to allow for prepayment or slot meters. Being desirous of treating the matter fairly, he computed it at the rate of 1·5d. Regarding a claim made for depreciation, he thought the Company were

wrong, because it did not follow that the depreciation took place during the year in question. They should allow for an average depreciation. The total actual working expenditure of the Company was £51,040, and he had allowed 5-12ths of this amount. Then, in regard to coal, he considered that the Company could reasonably work on a six weeks' supply. While the Company had estimated their stock at Christmas, 1913, at £3932, he considered that £2862 was a fair average of a six weeks' supply. He also referred to the co-partnership scheme of the Company. The money was invested in the Company. He calculated that 75 per cent. of this was for the hypothetical tenant and 25 per cent. only would be for the landlord. He allowed 50 per cent. on the depreciation of the old meters supplied by the Company; and these had cost £57,000. A great many meters had been taken out recently, and slot meters had been put in their place. Regarding new meters, in 1912 he allowed £209 depreciation and in 1913 £2601. They had only been in operation for two years. In 1913, 25,753 meters were in use; and 23,767 of these were 3-light and 5-light. He considered an allowance of 50 per cent. on these very reasonable.

Mr. GLOVER said that prepayment meters cost about £2 fixed, and the old meters 30s.

Tuesday, Nov. 24.

Upon the resuming of the proceedings to-day,

Witness was cross-examined by Mr. BALFOUR BROWNE.

The CHAIRMAN asked how many of the old type meters were actually in use in December, 1913.

Witness: Altogether 18,599—13,216 3-light, 3968 5-light, and 415 of various sizes. The wet underground meters numbered 7154; and there were 6245 cookers.

The CHAIRMAN: What would you allow for stock in ordinary circumstances, supposing that this meter and cooker business was not in a transitional stage?

Witness: I should not nearly allow so much as 5 per cent. That is for a reasonably good concern. In this case, I should allow about £3000 at the outside—about 3½ per cent.

Mr. GLOVER: You have allowed for everything up to, and including, the meter?

Witness: Yes; but for anything on the occupiers' side from the meter, nothing has been allowed.

Mr. GLOVER: Reference has been made to the allowance of 12½ per cent. Why have you allowed this amount?

Witness: Because from my experience that is a fair average figure to be allowed on all capital employed in this particular kind of work. The Company in their returns to Parliament say that they have charged 10 per cent. on their meters.

Replying to further questions, witness said he thought £63,000 capital of the Company was employed in meters. With regard to the capital of the hypothetical landlord and the hypothetical tenant, he had allocated 77·5 per cent. to the tenant and 22 5 per cent. to the landlord. The tenant was entitled to a greater proportion than the landlord, because he had greater risks. The actual capital of the Company was £492,000; but he had based his calculations upon £384,000.

Mr. GLOVER: As the result of your valuation, then, you have practically wiped-off £100,000?

Witness: Yes. In fact, it was admitted by the Company at the Board of Trade inquiry that the capital was about £100,000; and the Company obtained leave of Parliament to reduce it.

Mr. GLOVER: How have you divided the present capital of the concern?

Witness: In the following proportions: Landlords' capital, £298,190; tenants' capital, £86,500.

In answer to further questions, witness said he had made a valuation of the whole of the hereditaments; and for repairs, residuals, and insurance he had made a total of £9036.

Mr. GLOVER: In this estimate you arrived at a figure which gives you 4·28d. per 1000 cubic feet?

Witness: Yes; and I am quite justified in this estimate by the Gas Manager, who, when giving evidence before the Board of Trade, said that 4d. per 1000 cubic feet was enough. I was, however, desirous of allowing to the fullest extent, and therefore put it down at 5d.

Mr. BALFOUR BROWNE: Why did you take four months' receipts for residuals, because I suggest that three months is sufficient?

Witness: I do not agree.

Have you had any experience of managing a gas-works?—No.

That is why many of your figures are wrongly estimated. For instance, you have calculated upon a six weeks' supply of coal. Instead of six weeks', we have often—almost habitually—eight weeks' supply, or more.—You do not require it.

You evidently do not know much about the business. As regards consumers' deposits, I think that is capital we should use; but as regards superannuation, that has nothing to do with the tenant at all. Regarding the co-partnership scheme, an allowance is made to the workmen. When the amount reaches £10 they buy stock in the Company and get interest from it. Respecting the balance in the bank and the 10 per cent. thereon is the witness's mere estimate. But I should like to say that banks require gas companies to keep large amounts with them in order to provide for the trouble they have in the prepayment or slot meters.—It may be so where there are very many thousands of customers; but in this case you have only 7000.

I gather that in your receipts you get £51,393 for working expenses, as against £49,271?—Yes.

Proceeding, Counsel contended that proportionate to the profit which was being made, there was no reason for the increased assessment. As far back as 1896 the gross profits of the Company were £30,949; and in 1913 they had gone down to £26,827. They had spent on prepayment meters and cookers £30,000.

Witness: Yes, and on fittings. During the life of a meter, which is about twenty years, a sinking fund is created by yearly payments.

Mr. BALFOUR BROWNE: Have you ever thought of the competition which gas companies now have to face, considering the development of electricity?

Witness: Yes.

And also many other risks. For instance, I notice that at Neath two days ago something went wrong with the gas-works, and many of the more important places in the town had to suspend operations (even Church services could not be held); and yet in your estimate you narrow these risks to a very fine limit. While you limit an allowance of 12½ per cent., there have been cases, notably at Ipswich, where the Court of Judicature allowed 17½ per cent. Therefore, everything indicates that in the gas business there is considerable risk. You will no doubt have noticed also that some of the largest gas undertakings in the country have not been doing so well; in fact, their profits have fallen off enormously.—I do not know that.

Take an enterprising corporation like Manchester. In the year ending March 31, 1913, the profits were £263,563; but in the same period in 1914 they were £125,000—less than half the profit of the previous year. Yet you say the risks and prospects are not serious factors.—That the gross profit has fallen conveys nothing.

Mr. SUTTON: If we could have the figures of the Manchester Corporation gas-works, probably we could give some reason for this falling off, and some reason why the price of gas has been reduced in Manchester.

Mr. BALFOUR BROWNE: There are many gas companies who have increased their price.

Witness: They always do before the quinquennial valuation.

Mr. BALFOUR BROWNE: Then you have indicated that the coal purchased by the Company is obtained practically on the spot; but I question if you know where it has come from. Moreover, you do not appear to have taken into consideration the increased cost of production. In June, 1912, the Company paid only 12s. 3d. per ton for coal; in 1913, they paid 14s. 3d.; and in 1914, 15s. 3d. While coal has gone up in price, the residuals have come down. Furthermore, sulphate of ammonia was £14 11s. 10d. a ton in 1912, whereas in June, 1914, it was £11 18s. 6d., and to-day it is only £9 10s.—I notice from the reports the Company's Directors' have referred to the advance in wages, and in the price of materials. They did that in 1912 and 1913.

Yet in the face of that you have increased the gross and ratable values?—Yes; and I think the ratable value ought to be £20,000.

If we were making more gas and getting more for it the position could be better understood. On the other hand, while the expenses are increasing there has been a reduction in the price of gas; and whereas at one time the Company could charge 3s. 10d. per 1000 cubic feet, there is now a Provisional Order by which they cannot charge above a standard price of 3s. 4d.—Except in prepayment meters.

But that is the rent of the meter. Although we have power generally to reduce our candle power from 18 to 14 candles, we have an agreement with the Preston Corporation not to reduce it lower than 15 candles. Is it not a fact that the cost is more like 6d. per 1000 cubic feet than 5d.?—No.

I have a printed list before me which gives the returns of 54 gas companies. Some give 6·33d., others 5·71d., but the average is 5·96d. —Not one gas-works in Lancashire is included in the list.

There are many places, such as Bristol, Cambridge, and Croydon, where gas can be produced very much cheaper than at Preston.

Wednesday, Nov. 25.

Mr. BALFOUR BROWNE continued his cross-examination this morning. He asked witness if he knew the extent of the active competition the Gas Company had to meet from electricity. Witness replied that he had valued the electricity undertaking for the Assessment Committee. He considered electricity was being supplied at a reasonable rate. He did not know definitely that the Electric Company had taken from the Gas Company a considerable number of companies and mills. He was not aware that a number of mills had installations of their own.

Mr. BALFOUR BROWNE: If this is so, and we are losing, was it not a prudent and wise thing to try and increase our domestic supply; and the way to do this was to adopt this penny-in-the-slot system?

Witness: Yes.

You don't quarrel with the fact that we prudently and wisely spent £30,000 on it?—No.

Witness further said that if he valued the undertaking again he would increase the rateable value, inasmuch as the tenants' capital had been enormously increased.

Mr. BALFOUR BROWNE: Do you know that if we carry forward any more than one year's dividend under the Provisional Order of 1911 we are bound by agreement with the Corporation to reduce our price?

Witness: And hence the reason why you are so inflating your repairs and renewals account.

Referring to the superannuation and co-partnership funds, witness said that the Company had the advantage and benefit from these. The co-partnership fund did not appear to have been introduced until the year 1913.

The CHAIRMAN: Where does the benefit come in?

Mr. SUTTON: The Company have the use of the workmen's wages to the extent of a charge of 5 per cent.

The CHAIRMAN: But are the funds actually used by the Company?

Mr. SUTTON: As a matter of law the Company may use these funds in their business; and I contend that if an employee sought to restrain them doing so, he could not succeed.

Witness, in reply to Mr. SUTTON, said that in his extended experience in dealing with companies such as gas, railway, electric light, and tramways, these companies invariably adjusted the repairs and renewals account, because they knew they were not right for the purposes of the hypothetical tenant. In his valuation he felt he had made more than an ample allowance for average cost of repairs, renewals, and insurance. Following his valuation of 1911, he inspected the property on Nov. 27, 1912. The Glover Street works were not then being fired, although everything was there ready for use. He asked Mr. Tagg, the Manager, if the premises were in use; and that gentleman replied "Use your own judgment." He thereupon assumed that it was one of the works which was kept standing in the summer and used during the winter; and he put it in his estimate on this basis. He submitted that he could not get satisfactory information on this and other points. He told the Assessment Committee that the valuation was a tentative one

only, and that before they did anything with it in the way of deduction he advised the Committee that he must have the information asked for. On Dec. 21, 1912, he wrote to the advisers of the Committee, and complained that he was not being fairly treated.

Mr. BALFOUR BROWNE: I think that there is some misunderstanding on this point, for I am instructed that a letter was sent to you from the Company pointing out that the last date on which gas was made at the Glover Street works was Jan. 26, 1911. That is straightforward enough.

Witness: No such letter was received by me.

Therein is the information you were asking for?—As a matter of fact, this letter shows exactly what I contended—that until the Company came before the Assessment Committee early in 1913 they declined to give this information, and it was only then that they gave it.

I think you are under some misapprehension?—I am certain that I am not. In fact, in consequence of not giving proper information the Company are paying on a rateable value £1000 less than they ought to be.

Mr. SUTTON: The letter is there, and speaks for itself. The information did not come at the proper time and when it was asked for. This seems quite evident. Now, a great deal has been made of the competition of electricity. [To witness:] Have you had experience of this competition?

Witness: Any effect that the competition has had is reflected in the balance-sheet of 1913, and so is the loss or gain of a customer.

It appears, whatever the competition of the Electric Light Company may have been, there was a great increase in the total consumption of gas. That is a fact, is it not?—The consumption has shown a large increase, and, notwithstanding all the competition of the Electric Light Company, the Gas Company have always paid their standard dividend ever since the Electric Light Company started.

And have been able to put aside the special purposes fund and the redemption fund to which attention has already been called?—Yes. The consumption of gas has, in fact, increased during the years 1912 and 1913 from 505,804,700 cubic feet to 569,192,400 cubic feet.

If there had been no electric light and no loss of consumers the consumption might have been more?—If they had woke up in the past and had gone on the present lines, the consumption might have been more.

What you say is that the competition of the Electric Light Company has not been sufficient to check the sales of gas?—That is so.

Mr. SUTTON: We will turn for a moment to the question as to what profit is divisible as between the landlord and tenant.

Witness: I desire to point out that Mr. Farraday, the Valuer for the appellants, allows the tenant £21,147, and adding the rateable value, which he found at £10,270, this made a total profit of £31,417. I have put down £10,812 as tenant's remunerations, and adding the rateable value, which I found at £20,158, I estimated the total profit at £39,970. So that Mr. Farraday's valuation more than supports mine. The real question now to be decided is that of the allocation of profit between the landlord and tenant.

Mr. SUTTON was proceeding to ask the witness as to the landlord's capital, when

Mr. BALFOUR BROWNE remarked that they had already said that they accepted the landlord's capital as correct. As to the other point, it was a question for the Court and not for the witness to decide.

Mr. SUTTON (to witness): Do you agree that the difficulties of gas companies have increased?

Witness: In some ways; but this Company have had increased prosperity.

They have large and important powers bestowed upon them. You were aware of the agreement of the Company with the Preston Corporation?—Yes, I was aware that, by the agreement, the Company cannot reduce the power of the gas below 15 candles, although they have the authority to reduce it to 14-candle power.

Mr. *George Helps*, the Engineer to the Nuneaton Gas Company, was the next witness. He did not think there was any difficulty in ascertaining the amount that had been charged for up-keep and depreciation of plant. He had inspected the accounts of the Preston Gas Company. All repairs and renewals had been charged to revenue. He had gone into the repairs and renewals accounts for the last seven years, which included 1913. The consumption of gas had increased in this period to the extent of 83,000,000 cubic feet, and nothing had been charged for the extra plant which must have been put down in order to meet the increase.

The CHAIRMAN: No capital charge?

Witness: That is so. Moreover, there has been an increase in the length of mains. From 1907 to 1913 they have been extended 20,817 yards. I estimate the cost of these at £9390. If you divide that by 7 you get £1340 per year as an average sum.

Mr. BALFOUR BROWNE: The cost is your estimate?

Witness: Yes.

Mr. GLOVER: What would be a fair allowance for repairs, maintenance, and renewals?

Witness: I think 3½d. per 1000 cubic feet would be sufficient.

And what for the repairs, renewals, and maintenance of mains?—I should say 1d.

Replying to further questions, witness said he gave ¾d. per 1000 cubic feet for repairs, maintenance, and renewals of meters, and ¼d. for repairs, renewals, and maintenance of stoves (including cookers).

Mr. GLOVER: That is a total charge of 5·75d. Would 6·60d. per 1000 cubic feet in 1912 and 7·27d. in 1913 be a reasonable allowance for repairs, maintenance, and renewals?—No, it would not.

Replying to Mr. BALFOUR BROWNE, witness said he considered the life of a cast-iron wet meter was between forty and fifty years, and that of a tin-case meter twenty-five years, although he had known them to stand forty years. For a slot meter, he thought about ten or fifteen years.

Mr. GLOVER: In regard to Mr. Fuller's estimate. He allowed for repairs, renewals, and insurance £11,868, which works out at 5d. per 1000 cubic feet of gas sold. Do you think this a fair estimate?

Witness: I think it is a very fair one. It is a halfpenny more than my estimate.

Mr. BALFOUR BROWNE: You said that Mr. Tagg, the Manager, stated that he paid for mains out of revenue, and that it should have been laid to capital account.

Witness: I did not mean to say that.

Mr. BALFOUR BROWNE: In your estimates you have taken long periods, such as five or seven years. I would suggest there is some fallacy in taking a long average in companies of this kind.

Witness: I do not think so.

But commercial conditions are continually fluctuating. For instance, the cost of labour varies periodically, and, as I have pointed out, working materials vary considerably. What is the use of telling us that we were doing so and so in 1907? While we are put to a greater cost for production, we are limited as to the price we can charge for our gas.—It is generally taken for granted that, as wages go up, companies expect to get more from the men.

As to the meters, suppose the whole were new last year, would you allow 50 per cent.?—Obviously not. The allowance would be made in accordance with those in use.

Suppose half were old and the other half new, would you allow 50 per cent.?—No, it would go down to 25 per cent.

If companies had not something in the nature of a sinking fund for the purpose of replacing the articles which are worn out, everything would die out altogether.—I have not heard of any other gas company having a sinking fund of this kind. The object of the gas engineer is to keep up the whole capital value of the plant; he does not set out to take one specific thing like meters. If he did so, he would want a larger staff of accountants than was practical in works of this kind. Of course, I would be sorry to do anything to prevent anyone keeping up the value of the plant. You must take the whole of the works.

But every part of the works is dying, and you charge for this death in these accounts. For instance, there is not a penny charged for the replacement of the gasholder. Why should you not have a fund to replace this?—Such funds do not exist. I say that 4½d. per 1000 cubic feet sold is sufficient to keep up the repairs, maintenance, and renewal of the plant—in fact, this is proved by your own accounts. I say again that I do not know of any place where they have a sinking fund like that of the Preston Gas Company.

Is not 5 per cent. on the capital cost the usual figure to allow for repair and renewal of meters?—I have not taken it. It is too much.

Mr. SUTTON: Have the Company been expending a large sum on capital account?

Witness: That is proved by an examination of the accounts. There has been nothing charged to capital for the last seven years except this £30,000, which has been charged to the new slot meter and cooker business.

In cross-examination, witness said the consumption of gas per consumer in Preston was below the average.

Mr. BALFOUR BROWNE: Does that not account for the fact that more meters are required in Preston in proportion to the output than in ordinary cases?

Witness: It certainly makes a difference.

The repairs per 1000 cubic feet must be higher?—In some cases.

Mr. *C. F. Jones* next gave evidence. He had made an independent valuation of the Company's undertaking, based on the 1913 accounts. He estimated that the capital a hypothetical tenant would have to find on Dec. 31, 1913, was £90,000. In his judgment, 12½ per cent., or £11,250, would be sufficient remuneration. He put the amount to be deducted for statutables at £12,000, as against Mr. Fuller's £11,858, and estimated the rateable value at £19,705, as against Mr. Fuller's £20,158. The present rate appealed against, of £28,669 and £15,239 rateable, was very reasonable—in fact, it might have been put at a higher figure. In his opinion 12½ per cent. would be sufficient to replenish the stock as it wore out.

Mr. BALFOUR BROWNE remarked that in witness's estimates he mentioned renewals and depreciation. But they could not have both in this case, for they got it twice over. Witness's figures agreed to a great extent with those of Mr. Fuller; and he was more concerned as to where they differed. The only real difference was where he estimated the rateable value at £19,705, and Mr. Fuller at £20,158. But Mr. Fuller had taken less depreciation.

The CHAIRMAN: With regard to the old meters, what depreciation do you allow?

Witness: 50 per cent.

Replying to the CHAIRMAN, witness said in his experience it was customary to claim the superannuation fund. A hypothetical tenant finding there was a superannuation fund in existence would want to know what working expenses were chargeable to the fund before he could determine the rent he could give to the landlord. He would also say: "If I am to be responsible for this superannuation yearly, then you must hand over the fund which has been built up."

The CHAIRMAN: Do I understand the practice is that it is claimed, and allowed to be dealt with in the way you have dealt with it?

Witness: It is claimed; but we can very seldom tell from the decision of Quarter Sessions what is and what is not allowed.

The Case for the Company.

Mr. BALFOUR BROWNE then opened the case for the appellants. He said: I should think that this matter was not very complicated but for the fact that we have been discussing it for three days. What you have to do is to find out, in the words of the Parochial Assessment Act, the rent which may be reasonably expected now and in the future; and when you have got this you are to deduct the average annual cost of repairs, insurance, and other expenses necessary to maintain the hereditaments in a state to command such rent. We agree that in hereditaments of this sort the rent is to be arrived at by a calculation; and a calculation is what, looking at all the circumstances, a tenant can afford or reasonably be expected to pay in the future—not what he would have paid last year or ten years ago. With regard to this, it is obviously an ordinary matter for a tenant to calculate first of all what he has to pay out of it. In this particular case a tenant is going to come in and direct the gas company as a commercial undertaking, and to make a profit; and the first thing he must ascertain, as far as possible, is what profit can he make. It depends on what rent he can afford to

pay. One of the first things to ascertain is the probable gross receipts; and we were agreed as to the gross receipts until a minute or two ago. I said, and I say now, that if there were receipts from any source of the gas undertaking, receipts from meters, they ought to be a part of the receipts, and I said that £14,050 should go in. But Mr. Jones has told you that he has deducted the proportion of £6001. He has deducted it as depreciation; but he cannot deduct it as depreciation and treat it as receipts. With this exception, there is really very little difference between us until we come to the occupier's share. There are two or three matters I have to mention which are comparatively small. First upon the working expenses which are given by Mr. Fuller. Regarding these, we should be agreed but for the small and ridiculous corrections made in our accounts by Mr. Fuller. I do not know whether Mr. Jones made them or not. I find that Mr. Fuller cut down by one-half the Directors' allowances—from £400 to £200. I would ask you if a tenant was a company, as he would naturally be, would he not require a directorate? And would it not be ridiculous to act as he suggested? The landlord is only receiving the rent. It is the same with the auditor, who, he says, receives £150, but he can only give you £100 of that. The keeping of these accounts is statutory, and would be in the case of the hypothetical tenant. There is nothing in this question at all, until you come to the net receipts. The difference between us is that they take £51,393, and we make it £49,271. We are proceeding on the right lines—that is to say, we have taken all that a man can reasonably do; we deduct what it would cost. But now we come to the parting of the ways, and say what would a tenant want for himself, or what should be the tenant's remuneration, and what the landlord would expect.

The CHAIRMAN: What figures did you start with?

Mr. BALFOUR BROWNE: I make it £100,982, and Mr. Fuller says it is £102,432.

Thursday, Nov. 26.

Mr. BALFOUR BROWNE, resuming his speech this morning, said: Last night I directed attention to the words in the Parochial Assessment Act, under which you have to determine this matter. First, you have to arrive at the rent which might be reasonably expected, and "expected" here is obviously looking to the future. I ask you to consider everything that would affect a possible tenant's mind as to the future. Due regard must be given to the meaning of the word "expected." I particularly emphasize this, because no tenant in his senses would take over a concern without being assured that the hereditaments would be such as to assure the tenant a fair opportunity of being successful. He would have to make a thorough and accurate calculation. It is obvious that the tenant must ascertain what profit he is going to make; and upon this depends the rent he can afford to pay. The point to consider is what is the tenant's remuneration to be, not what the landlord expects. Let us analyze the position as it affects the Preston Gas Company. In 1896 the gross profit was £30,949; and the profit earned in 1903, according to the accounts, was £26,827. A tenant, looking at these figures and seeing that the profits which he could put into his pocket have gone down by £4000, would say he could not give a penny more than he gave in 1896. He would not only look at that, but he would take into consideration the general position of affairs, and would look at the gross profits which had obtained in several past years, and would consider the general outlook in 1914 and future years. Indeed, the tenant is bound to look a little bit into the future. Taking the accounts for other years, we find that in the year ending June, 1912, the profit was £32,223; and in the year to June, 1914, £24,700. What does this mean? It means that in 1912 it showed 16·07d. per 1000 cubic feet gross profit, out of which you have to deal with both the landlord and the tenant. In 1913 the gross profit was only 13·37d., and in 1914 it was 9·98d.; showing an absolute reduction of about 5d. per 1000 cubic feet. In these circumstances, I ask the Court to come to the conclusion that there is no justification at all for disturbing the rating that existed in 1911. You must look at the prospects; and at the present time they appear to be exceedingly bad, for they had to take into consideration the extra price of coal, which increased the cost by £3710. One of the complaints of the respondents is that instead of dividing, as we should have done, large sums of money, we have been spending on capital account. This, I submit, is for the benefit of the consumers; for revenue spent on capital account reduces, or rather keeps down, the price of gas. Mr. Helps gave his evidence with great fairness, and admitted that there were no faults to be found with the accounts; and if you find that the Company have been doing their duty, as they undoubtedly have been doing, then they ought to be treated in such a way as would not interfere or hamper their future operations. In the year 1913 we spent on repairs and maintenance £12,900, and we must look to the future. There could be no doubt that the appellants were face to face with most active competition from the Electric Light Company, and that a considerable number of mills that were formerly customers of the appellants had installed electric light and were supplying themselves; and the Directors, to maintain their position, had spent large sums of money on slot meters and stoves in order to keep up the domestic supply. It was generally admitted that the Company were doing all they possibly could. This was reflected in the fact that they were making more gas, and had put an enormous amount of capital into the undertaking; but at the same time they were getting less profit. Was not this in the interests of the consumers and the community in general? It had been argued for the respondents that if an allowance of 17½ per cent. were made they would swamp the rateable value; but if the Court accepted the figure of £29,000 as depreciation, then they would swamp not only the rateable value, but any tenant who might take these premises.

At this stage,

The CHAIRMAN remarked that the case was one of extraordinary complexity and exceedingly difficult and technical. They had their experts on both sides, and now that the arguments were known to each side he asked if it were not possible to mutually arrive at a solution and at a mutual decision. He wanted to be fair to both parties.

The arguments, however, continued; objection being taken by Mr. SUTTON to the introduction of the accounts for 1914.

The CHAIRMAN: We are basing the arguments on the 1913 accounts, but that does not stop the hypothetical tenant reasonably anticipating the trend of future events. The outlook has to be taken into consideration, as conditions vary.

Mr. BALFOUR BROWNE: The decision of the Assessment Committee was not made until July 31 last; and then they had the figures of 1913 and part of the 1914 accounts before them. At the same time it was known that the price of coal and oil had advanced, and that there had been a drop in residuals. Then they decided to reduce the rateable from £17,000 odd to £15,000 odd.

Mr. SUTTON: All of which is reflected in the 1913 accounts. We had not the 1914 accounts before us at all.

The CHAIRMAN: We have not had the 1914 accounts discussed, and Mr. Sutton is quite right in asking you to draw the line on the 1913 accounts.

Mr. BALFOUR BROWNE: Yes, we both agreed to work on the 1913 accounts. But the incoming tenant is bound to look into the future; and it is well known he would have to pay more for his coal. There is *primâ facie* evidence of real value in the 1913 accounts; but I should have increased working expenses by £3000 on the 1914 account.

Mr. SUTTON: I submit the 1914 accounts ought not to have been introduced.

Mr. BALFOUR BROWNE said that the legitimate deductions a tenant would make did not exclude the price of coal; and he could not overlook the fact that, owing to the advance, his future position would be worse than it was at present. In such circumstances he would not be able to maintain his dividends.

Reference was then made to the estimates put in by Mr. Fuller.

Mr. BALFOUR BROWNE mentioned that Mr. Fuller at first stated that the rateable value should be over £17,000. He said this when he was before the Assessment Committee. Then he reduced it to £15 000; and to justify this he put in his table.

The CHAIRMAN: Mr. Fuller's real opinion is that you should be rated at £20,000.

Mr. BALFOUR BROWNE: In order to do so, he puts the gross estimated rental of the undertaking at £31,992. The real fact is that he knew that he could not increase the gross. But in order to secure this rating, and to justify it, he has to increase the gross.

The CHAIRMAN: Yes, in order to justify his rateable value of £20,000 he has to raise the gross to £31,000.

Mr. BALFOUR BROWNE: To take his own table the gross is £28,669, and the rateable £15,236. What is the difference between the two?

The CHAIRMAN: We have to consider whether or not the net rateable of £15,000 is right.

Mr. BALFOUR BROWNE: I submit that you have also to consider the whole question of the Assessment Committee, and whether they were right in confirming the £28,000 gross.

The CHAIRMAN: But supposing we adopted your view. What would you do about the gross? We cannot raise it for this purpose, and we cannot reduce it.

Mr. BALFOUR BROWNE: You must get it in the way the Act points out, which is a gross estimated rental, deducting therefrom the statutables. After you have arrived at the gross estimated rental, you must deduct from it the amount that is necessary for the maintenance of the hereditaments in such a state as to command the rent. The excuse that the rateable was reduced because of the Glover Street works was entirely wrong. If it had been rated, they ought to have reduced the gross too.

The CHAIRMAN: The real material difficulty is the net.

Mr. BALFOUR BROWNE: But you have to arrive at it as the law points out. I can prove a figure higher than the £13,490 for statutables; and I do not believe that it is mere arithmetic. I believe it was a calculation of what the statutables were. One figure was 4½d.; according to Mr. Fuller it was 5d. In our case it has cost us in the last five years 6·12d.—the same figure that Mr. Helps worked on at Nuneaton; and if you take this figure the statutables come to over £14,000. The point was what should the occupier's share be, and, as a corollary to this, what remuneration was he entitled to? Mr. Jones makes it £11,250; we make it £31,147. In the main, the tenant's capital is in regard to meters. Then there is the question of cookers, for which the customers did not find capital; and they got them merely for the penny-in-the-slot. That was where, of course, a great deal of capital was absorbed.

The CHAIRMAN remarked that the cooker business was a new source of revenue.

Mr. BALFOUR BROWNE: A cooker costs £2, and a meter £2; and what is taken out when these are fixed is only a 30s. meter.

The CHAIRMAN: But is it fair to compare it as a loss of £4 for 30s.?

Mr. BALFOUR BROWNE: Yes, I think so. We have depreciated the old meters 20 per cent., although we do not think they have depreciated to this extent. In these circumstances, I say that the capital required is not to be reduced by the large sum of £29,000, but by a very much smaller sum. May I ask you to consider how this reduction of £29,000 is to be made?

The CHAIRMAN: You have got your repairs and renewal accounts.

Mr. BALFOUR BROWNE: No. There are things you cannot renew because they are not worn out in any particular year; and if there is depreciation, we are entitled to a sinking fund. We take off 20 per cent. from the cost of the meters for depreciation.

The CHAIRMAN: Certain witnesses allow an all-round depreciation of 33 per cent. Which is right, 20 or 33 per cent.? Have you ever heard of 33⅓ per cent. being applied all round?

Mr. BALFOUR BROWNE: I cannot say that I have. If there is depreciation, and it cannot be paid out of the returns of the Company, then you will see that a sinking fund is necessary. It had been argued by the respondents that if an allowance of 17½ per cent. were made, it would swamp the rateable value. But if the figure of £29,000 as depreciation was accepted, the rateable value would be swamped and also any tenant who might take the premises.

The CHAIRMAN: I am not now discussing the 17½ per cent. Is there any argument as to what you allow for that which the tenant has got to scrap—any portion of his plant? Do you argue that a liberal percentage must be allowed—17½ per cent. or anything else?

Mr. BALFOUR BROWNE: I must get it somewhere. The first duty is to decide the tenant's requirements and the depreciation that should be

allowed off. The difference between us is that Mr. Jones says that the tenant's capital required is £89,678, and we say it is £120,844. If I can prove these figures (as I can, because they are taken from the accounts), then we are entitled to what we claim. The tenant has innumerable risks such as strikes, just the same as the one at Neath, which might be put at 2½ per cent.; and with the depreciation at 5 per cent., you have only 10 per cent. left for the rest of the risks. All the tenant has is a tenancy from one year to another.

Mr. SUTTON: The law assumes that the tenant is not to be unreasonably disturbed.

Mr. BALFOUR BROWNE: Do you think that any man in his right senses would take over such risks at the cost of £100,000, and be content with 10 per cent. and the outlook only be for one year? I think that 10 per cent. in these circumstances would be insufficient. It has been said that many gas companies have been worked on a 12½ per cent. basis; but I do not know a single instance of the kind. In the Ipswich case, the Recorder held that 17½ per cent. was right when the fittings were included. Personally, I do not know a single case where less than 17½ per cent. has been given in circumstances like this.

Referring to the evidence of Mr. Helps, Mr. BALFOUR BROWNE said that in the main it agreed with their own; and if the Court considered that 6d. was the right figure, it worked out at £14,000.

At this stage, the representatives of both parties retired, but were unable to come to any agreement. Further evidence was then called.

Mr. *Phillip M. Farraday* said he had valued the Preston Gas Company's business, and had based his figures upon the Company's accounts for 1913. He found that the business was very carefully managed, and nothing in any department was spent unwisely. There was virtually no difference between himself and Mr. Jones in regard to the figures. As to gross receipts, the amounts were the same. For working expenses, his figure was £51,771; while Mr. Jones allowed £51,763. In regard to residuals, witness took three months' trading, because credit was given to the extent of six weeks in a number of cases. But Mr. Fuller was wrong so far as coal was concerned. The latter gentleman allowed for six weeks' stock of coal. But, as a matter of fact, the Company only got ten days' credit; and the difference between them was the difference of knowledge as to the exact circumstances in which the Company were working. Respecting the prepayment meters, four months' allowance was based upon the assumption that the Company collected from the slots every four weeks; but, as a matter of fact, they collected every six weeks. He took the basis of every 3½ months instead of Mr. Fuller's 4 months. He considered the consumers' deposits money the Company could use—it could be fairly treated as cash in the hands of the Company.

Mr. BALFOUR BROWNE: With regard to the superannuation fund and the co-partnership?

Witness: Part of the wages of the men is kept back; and when the amount reaches £10, it is passed into the stock of the Company. The men are given 5 per cent. on the wages they actually earn.

Should superannuation be taken into consideration in the rating?—This is the first time I have heard of it being brought in.

It has been held that the coal obtained by the Company would not be affected in the case of a railway strike because it could be brought by road in emergency.—To bring the coal by road is impossible in practice.

Mr. Fuller claims 50 per cent. on the old meters.—I claim nothing off the new meters, and only 20 per cent. off the old ones.

Replying to further questions, witness said he had known no figure but 17½ per cent. for trading purposes. One exception was at Ipswich, where he tried to get 15½ per cent. He thought the risks of a gas company were considerable, and consequently the rateable value should be reduced. Having regard to the fact that coals and oil were going up in price, and residuals were going down, he thought a prospective tenant would give less to-day than he would in 1911. A larger amount of gas had to be manufactured to make the same profit.

Mr. BALFOUR BROWNE: The gross receipts in 1892 were £76,000 and the net profit £24,000, and in 1913 they were £120,000 and £26,000 respectively. So that we have manufactured all this extra gas and made less money. Do you not think the rating ought to be in proportion to the profits made?

Witness: Yes, it is the rule in regard to gas companies.

Mr. SUTTON: Certain witnesses have allowed 33 per cent. all round, and you allow only 20 per cent.?

Witness: Only on the meters. The result of the war means that they are not able to put in any more stock meters.

At this stage, a further consultation took place between Counsel and the parties interested. At its conclusion,

Mr. BALFOUR BROWNE said: We have arranged that the rateable value for the financial year of 1913 shall be fixed at £14,000, and for the subsequent three years at £13,000. We are also prepared to pay them £350 towards their costs.

It was agreed that the districts should pay in the following proportion: Preston—gross £25,134, rateable £12,943; Broughton—gross £10, rateable £8; Fulwood—gross £341, rateable £273; Walton-le-Dale—gross £1020, rateable £700; Penworthane—gross £51, rateable £41; Farrington—gross £41, rateable £32; Lea, Ashton Ingle, and Cottam—gross £4, rateable £3; total—gross £26,600, rateable £14,000.

DISCS IN PREPAYMENT METERS.

Action against the Manchester Corporation.

At the Manchester Assizes last Wednesday, an action to recover damages for alleged malicious prosecution was brought by Margaret Adelaide Hargreaves, otherwise Smith, a married woman, who has been living at the house of her father at No. 33, Chorlton Road, Hulme, against the Corporation of Manchester was tried before Mr. Justice SANKEY and a Common Jury.

Mr. E. T. NELSON (instructed by Messrs. G. L. Welford and Co.) appeared for the plaintiff; and Mr. ATKINSON, K.C., and Mr. WINGATE SAUL represented the Corporation.

The case arose out of the prosecution of the plaintiff by the Manchester Corporation Gas Department* on charges of fraudulently abstracting gas and of stealing gas from an automatic gas-meter. She was convicted of the former offence (wrongfully as she alleged), but acquitted of the second; and it was upon this that the action was brought. It was admitted, on her behalf, that when short of coppers she used discs for the purpose of getting a supply of gas; but it was also said that she acquainted the collector of the fact when he called to take the money from the meter, and offered to pay the shortage. She appealed against the conviction for fraudulently abstracting gas; but the appeal was dismissed on the objection of the Corporation that notice of appeal had not been properly served.

Mr. *Robert Bell*, Deputy Magistrates' Clerk for the City of Manchester, said that the charge of stealing gas was not proceeded with against the plaintiff; and this was how it came to be marked "Dismissed" in the Summons' Register.

The defence was that there was reasonable and probable cause for laying the charge against the plaintiff; that the charge was not dismissed; and that the plaintiff was convicted on another charge.

Upon the evidence of the plaintiff being concluded—evidence which substantially covered the grounds already reported in the "JOURNAL,"

Mr. ATKINSON submitted there was no case to go to the Jury.

His LORDSHIP upheld this view, and gave judgment without costs for the Corporation, who, he thought, had dealt very tenderly with the plaintiff. It was fortunate for her that she was not in a worse position.

* See "JOURNAL," Vol. CXXVII., p. 295.

MISCELLANEOUS NEWS.

PATRIOTIC MEETING AT THE BECKTON GAS-WORKS.

Mr. Will Crooks, M.P., on "The Holy War."

Sir Corbet Woodall, D.Sc., the Governor of the Gas Light and Coke Company, visited the Beckton works on Sunday morning, Nov. 22, and presided over a splendid meeting of men in the Rifle Range Buildings. The meeting assembled for the purpose of hearing Mr. Will Crooks, M.P., on the national crisis; and after some eloquent remarks from the chair, Mr. Crooks delivered a fine patriotic address. There were also on the platform Mr. D. Milne Watson (General Manager), Mr. T. Goulden (Chief Engineer), Mr. H. Rayner (Secretary), Mr. T. S. Lacey (Resident Engineer at Beckton), and Captain Irving (Staff Recruiting Officer at Woolwich).

THE GOVERNOR'S SPEECH.

The GOVERNOR said: Fellow workers for the Gas Light and Coke Company, my special duty to-day is, as representing the Company, to bid a welcome to our friend Mr. William Crooks, M.P, who has come here to address us. Mr. Crooks's name is familiar to all of us; and we are very glad to make his personal acquaintance. He has had a long term of public work; and the result is that, whether in Parliament or throughout the country, he is held, I believe, in universal esteem and respect. [Applause.] He will this morning talk to us of the war, and call to our attention the urgent need that exists for the enlistment of a larger number of men to fight the battles of our country and to preserve its independence and its freedom. Not only that, one may say, but to uphold the freedom of the nations of Europe as against the arrogant claims of the German Emperor. Thanks to our sailors and our soldiers, the terrible war which is devastating Europe has not yet crossed the sea to visit our shores. But how near it is I do not think some of us appreciate. If we travelled hardly further than to Birmingham, a town we can reach in two hours from London—about one-half the distance from here to Plymouth—we should be in the midst of fighting as terrible, and destruction as relentless and brutal, as the world has ever seen. Thanks, as I have said, to our sailors and our soldiers, the enemy is on the other side of the water. Here the sun shines on peaceful fields and prosperous towns. Our men carry on their work undisturbed, and our women sing and play with their children, none daring to make them afraid. On the other side of the narrow seas, beautiful buildings and towns are wantonly destroyed, while innocent people—men, women, and children—are ruthlessly murdered by those pledged to their protection. I want—and it will be Mr. Crooks's mission this morning to bring home to us—I want you to realize, though we do not fight simply for ourselves (we, too, are pledged to the protection of Belgium), how close the war is, and what it means to us and to those dear to us.

We are told by the Kaiser himself, and therefore we must believe it, that his heart bleeds because of the sufferings of the innocent people of Belgium. Let us see how this sympathy is shown. I read with repugnance a story given in yesterday's newspapers. [Having read the account of a shocking occurrence near Sambre, Sir Corbet continued:] If this is the treatment dealt out to those who have the Kaiser's sympathy, what would be the fate of Britons, against whom he and all the military caste of Germany have declared their undying hate, and that the war shall not close till our country is crushed, our navy destroyed, and our colonies and dependencies taken from us? This is a democratic country; and I think Mr. Crooks may possibly tell you that a democracy hates war. Yet we find the party of which Mr. Crooks is an honoured member almost universally urging that this war should be carried on and brought through triumphantly. They do this because they know that, if the enemy triumphs, then there is an end, not only to democracy as we understand it, but also to freedom and independence.

Men, you have decided that eight hours is a fair period for a man to work in a day; and, granted that the work is fairly done, we agree

that it is so. At the end of that spell, you are able to return home for rest and recreation. You can do this because there are men (reserves) ready to take your places. What about your mates and others from all over the country who are working at the front to-day? They are calling loudly for reliefs. Do they have an eight-hour day? There are not men enough to make this possible. On the contrary, they have been for days and nights unbroken, standing in the trenches, taking a sleep when they can, holding their rifles in their hands. A friend received a letter the other day from a General commanding cavalry at the front. He mentioned, incidentally, that for ten days he had not had his boots off. This kind of thing has to go on, and is taken by the men quite cheerily and happily. The men work with good will, and apparently with great enjoyment—especially when they can make personal calls upon the Germans in their quarters. But is it fair that one man should be called upon to do this strenuous work, which requires three or four? The need is to shorten the war; and to shorten the war there should be a preponderance of men on our side. We have been see-sawing to and fro for five or six weeks on end; and the position seems to be almost the same now as it was at the beginning of the struggle, save for the sad tale of dead and wounded men. If, when we get the Germans retreating, we can keep them running, what a blessing it will be, and what a number of lives it will save! Therefore we ask you, do not stand back now, but let there be men enough to carry the war through to a victorious issue. I should feel ashamed to ask another man to join the army as if it were something he was doing to please me or hundreds such as myself. What Mr. Crooks will do is to put before you the plain situation, and point out to you what is the duty to be done.

Among the last words of Lord Roberts before he went to France were: "I think it is the best thing there is for me to do." If we would only govern our actions by that principle, "What is the best thing, the right thing for me to do, what is the duty incumbent upon me," the conscience of every man would settle for himself what his action should be. ["Hear, hear," and applause.]

Mr. Crooks's Appeal.

Mr. Will Crooks, who was cordially received, said they had ceased to have public meetings now on this or that subject; they had ceased to know the master from the man; they had ceased to know one politician from another politician. In fact, they were absolutely one family. The reason was that there was a common enemy, and they had got to line-up and protect their families. They had come to the conclusion that their country was in danger. It was no aristocrats' war, or a capitalist war; it was simply a holy war for everything they held near and dear to them. The inside of every little room was in danger. They were in danger of having their homes upset, and being worried with things they did not want to be worried with; and all because they spoiled the Kaiser. He was the spoilt darling of Europe. Everything he said or did they regarded as great, because it was the Kaiser! They had sent peace missions to Germany—he had been with them himself. Now, he felt as if someone had sold him a purse—with three halfpence in it. [Laughter.] He once even proposed the Kaiser's health! They could not be more sorry about it than he. The Kaiser had become like all other spoiled darlings, a bully and a tyrant; and they had got to spank him. [Laughter.] He often wondered what their pioneer brothers beyond the seas thought of it. They did not quite realize what it was that bound the British Empire; they had not got to the root of it yet. The German Emperor would know all about it in a month or two. ["Hear, hear."] In this fight the man at the village-pump, the man in the gas-works, in the mine, or in the factory, and the "Johnny" in Hyde Park were all on the job. That was the secret of this fight.

After the King, as Prince of Wales, and Queen Mary, as Princess, went round the world, a great meeting was held at the Guildhall. Among other memorable phrases the King used was this, "Wherever we went, the people's hearts swelled with conscious pride at their co-partnership in the British Empire." What did it mean? He could hear some of them asking "What have I got?" and answering, "I have got no land or money." They had got something which was priceless. They had got a soul that they dared call their own, a share of liberty of saying what was in their mind to the highest or the lowest without fear of being shot for it. This liberty had been bought for them at a sacrifice they little dreamt of to-day. It was in danger now. No right to go out to fight? Their brothers were there. Were they going to see them murdered? Their neglect meant nothing else than murder. They who could, were bound to go. Working men, trade unionists, socialists—he appealed to them all to think of it. There were four millions of them round the Reichstag almost; they could not influence Prussian militarism against this war. What would happen if Britain were conquered? They had sent deputations to the Chancellor of the Exchequer demanding of the Government that where there was distress caused by the war, an amount of money should be placed at the disposal of the trade unions to meet it. No one had charged them with *lèse majesté*. The trade union funds in Germany were at the disposal of the Kaiser. They were not asking for money over there; they were asking for bits of paper for what they had got. Perhaps, when the war was over, they would get it back. [Laughter.]

Not many months ago indignation meetings were being held in consequence of the deportation of nine working men's representatives from South Africa, for daring to say they had a soul of their own in the British Empire. Dr. Poutsma, who was Kruger's right-hand man in the Boer war, was one of the nine. After leaving England he went to Germany. Three or four days after war was declared, he was in the lobby of the House of Commons; and in reply to his (the speaker's) inquiries, he said, "I am going to offer my services to the British Government, either at Home or abroad. I am going to fight for the old land." Having suffered all the injustice he could suffer under the British flag, Dr. Poutsma preferred it to the "freedom" that the Kaiser could give him. [Applause.]

"I want to ask the young man of to-day," Mr. Crooks continued, "what he thinks of it all." The generations yet unborn would be talking of them. Great and indispensable though a man may think himself—a breath, and he was but a memory. What should this memory be to the generations to come? Would they be saying, under tyranny and military despotism, "Curse on our fathers and our grandfathers, who in 1914 had a chance of settling military despotism and tyranny for all time," or would they say, "Blessed are the names of the men who fought in 1914 and saved us from tyranny," such as they now read about? They would say of these men, "They had hands of iron and hearts of gold."

After all, to show how exceedingly human they all were, there was one guiding inspiration and principle of every man's life; it was "Home—its ease and comfort." No more would their home be their home were they under the Kaiser. Across the North Sea thousands of little innocents had been slaughtered by this "bloody monster." In face of this, could they, as Britishers, stand back and refrain from "stretching him out?" He asked them to think of it, and take it home. It should stir every man who could to fight to the last. He would rather see the British race blotted out than he would see them surrender to the Kaiser under any circumstances. There was hard work to do; and he appealed to them to think of their duty and obligations to the men who had gone. If they felt a little dull, a little downhearted, a little doubtful, he would ask them to remember his parting words, "Be strong!" [Applause.]

Captain Irving emphasized the country's need of more men, and invited single men between the ages of 19 and 35 to step in front of the platform. Between forty and fifty young men responded, and gave in their names afterwards.

The Company's Example.

Thanks were expressed to Mr. Crooks for his address, and

The Governor (Sir Corbet Woodall), responding to a vote of thanks to himself, said: It has been to me a very touching meeting. I can only see the serious side of the situation we are occupying to-day; and it makes it very difficult for me to say anything at all. I am glad the appeal has been made especially to the unmarried young fellows. The appeal may come to the married men later; we hope that it will not. Go to-day as willing men, rather than wait for the command which will compel us, as though we went unwillingly to fight for our country. For you who have come out in this public and patriotic way, we shall all pray that good luck may go with you, and with all your mates who have gone or will follow you. This is a time of great trial for our Company. We are meeting with a decreased output, decreased profits, and increased expenses in many directions. I am speaking for my colleagues, however, as for myself when I say that we shall not grudge what we have undertaken to do for the wives, dependants, and relatives of those who have gone to the front. We shall do all that in us lies to bring to a successful issue this—on our part—most righteous war. [Applause.]

Before and also after the meeting appropriate music was rendered by the band of the Company's Kilburn Branch, under the conductorship of Mr. J. Walker.

ORIENTAL GAS COMPANY, LIMITED.

The Ordinary General Meeting of this Company was held last Wednesday, at the London Offices, Finsbury House, Blomfield Street, E.C.—Mr. H. D. Ellis in the chair.

The Secretary (Mr. H. J. Luff) read the notice convening the meeting; and the Directors' report and the statement of accounts were taken as read. The Auditors' certificate was read.

The Revenue Account Examined—Consideration for the Capital Account.

The Chairman, in moving the adoption of the report and accounts, dealt first with the revenue statement. He said the first item on the credit side was that of gas-rental (£69,477); and, as this was fully explained in the report, he need not labour it. The second item, residual products (£24,784), was also dealt with in the report; but to what was said there, he might add that the badness of the Indian markets was not to be wondered at. Residuals were like harvests. They had a good year, then a bad year, and then a middling year, fitfully and capriciously. They might, however, congratulate themselves that the Indian markets had not been as bad as the English ones. It was a matter of notoriety that this year the residuals markets in England had been so flat that the home gas industry had suffered very materially indeed; and it was some consolation to them to know that their own Company was better off in this respect than those at home. There was another point which he might add; and it was that, although residuals had realized less in money, the working of the year had been better—the percentages of coke, tar, and ammoniacal liquor produced per ton of coal carbonized showed a gratifying increase over the figures of the previous year. Going to the debit side of the account, it would be seen that some good savings had been made in the first item—coals, purification, and wages. Here, again, he was pleased to say that good working had assisted them; for the output of gas per ton of coal carbonized was fully 400 cubic feet greater than in the year 1913. In the item of Indian income-tax, there was a small saving. Though small, when counting their profitable fish they liked to include the little ones. Income-tax was not a very pleasant subject just now. At one time, he anticipated that he might be able to say something pleasant about it. Last July, when the report stage of the Finance Bill was being taken in the House of Commons, it was pointed out to the Government by some members that it was very unfair that parties should be charged income-tax twice over—that was to say, in two different countries—in respect of the same profits. The Government recognized this; and they agreed to some modification, under which a deduction would be allowed in respect of income-tax paid in the country whence the profits were derived. It was a fair promise. Since July, however, much unfortunately had happened; and he did not think the Government would be, for a time at least, in the position to make any concession in this or any other respect. The next items—mains, meters, services, fittings, and wear and tear of works—amounted to upwards of £300 more than they did in the corresponding account of the previous year. But when it was considered that there had been carried to the debit of the revenue account,

and mostly in these items, a sum of nearly £4800 which was fairly chargeable to capital, he thought the shareholders would agree with him that this small increase was highly gratifying. Bad debts and allowances showed a small increase of £170; but this was more apparent than real. The shareholders knew the Board were very conservative people; and they charged to this item a small sum annually as an insurance or reserve against bad debts. Thus it did not mean that the bad debts had amounted to more, but that in it was a measure of prudence as a reserve. The next item, general expenses, did exhibit a considerable increase—an increase of £1859. This demanded some explanation. Between £1400 and £1500 were costs incurred in the arbitration proceedings between the Company and the Calcutta Municipality. This matter he had fully gone into on previous occasions, in view of what these arbitration proceedings would give rise to, and because of the happy result which they welcomed at the conclusion of them. Now they had the further result in costs; and in respect of them they carried this year between £1400 and £1500 to the debit of general expenses. This increase would not recur next year. Had the Directors thought it desirable to do so, they could have carried these costs to the debit of profit and loss, seeing that the outlay was in respect of many years, and not assignable solely to the year 1913-14. Not only could they have carried the expenses to profit and loss, but he should have been prepared to argue, if necessary, that they would have been justified in carrying them to capital. He would tell them why. In the case of English companies applying to Parliament by means of a Bill, for a constitution or for new conditions of working, it was the practice of Parliament to authorize the parliamentary charges being carried to the debit of capital account. These arbitration expenses were on all-fours with the costs of promoting a Bill in Parliament. They were expenses incurred in settling and adjusting the Company's constitution (so to speak) and their conditions of working over a period of twenty years. The future of the Company was dependent upon this arbitration; and the Company were therefore in a position analogous to a company seeking to obtain a similar end by the process of parliamentary proceedings in this country, and who would be entitled to debit the costs to capital. The Directors had not done this. They had carried the expenses to the debit of the revenue of the year, together with other outlay, as already mentioned. In doing this, they had followed the established practice of the Company, which had been approved over and over again in that room by the shareholders—to save the capital as much as possible, when they had the revenue to discharge their liabilities out of it. The result was they had a profit balance of £24,236; and, of course, had they chosen to carry the charges named to capital, they would have increased the balance by £6000 odd, which would have converted the £24,000 into £30,000 odd. This would have looked very pretty on paper, but he did not think it would have been such sound finance as the course the Directors had pursued.

THE BALANCE-SHEET—TEMPTING PROMPT PAYMENT.

So much for the revenue account. Turning to the balance-sheet, he could sum that up in very few words, as revealing a very sound position. On the debit side, they had made a small profit of £120 in the exchange. The amount due by the Company—their debts on June 30—had been reduced by between £2900 and £3000. This was a satisfactory position. The loan from the bank had been lowered by £1050. The bank loan was the Company's working capital. Instead of raising capital by the issue of stock, they raised capital by loan from the bank; and so they obtained working capital much cheaper, and from time to time they could increase or reduce it according to their circumstances or necessities. With every remittance sent over, they reduced the loan at the bank, and immediately stopped interest running on so much of it. The Directors thus had the liability under control; and it was the soundest finance of which he knew. On the credit side, the amount due to the Company was less than the corresponding item in the previous year by no less than £10,500. It had been observed before at one of their meetings that the amount then due to the Company was high; and he was bound to admit that it certainly was so—that there were more arrears of gas-rental carried forward than he at all liked to see—and he could assure the shareholders that the Board would do their utmost to reduce it. This was the result. Of the £10,500, £8500 was the reduction of the amount owing on gas-rental. He was informed from Calcutta that, in all probability, this was largely due to the step taken by the Directors last New Year's Day, when they made a reduction to the private consumers on condition of prompt payment. For prompt payment, they now made an allowance of 8d. per 1000 cubic feet, which was handsome. The result was that the consumers took very good care to entitle themselves to the benefit of the rebate; and so it was the arrears had been reduced by £8500. Coals, products, and sundry stores showed an increase of £1173. This was because there was more in stock on June 30. The Board took care to keep down the book values of the coal, products, and sundry stores as much as possible. They had always done this; and they continued to do it, as it was all on the safe side. The next item was the amount invested. It remained on the books as before; but the actual market value last June showed a small increase (true only £63) over the corresponding period of 1913. It was gratifying to see a move upwards at all, because, as they all knew, gilt-edged securities had sunk and sunk year after year in market value until they looked as though they were going to vanish.

AN EXCLUSIVE PUBLIC LIGHTING CONTRACT.

This was the position with regard to the accounts; and he thought it would be satisfactory to every mind. Turning to the report, the Directors there told the shareholders about the general operations and what they had done with regard to the works. He might say generally that the maintenance of the plant and buildings had received their careful attention as usual, and all necessary repairs had been executed, with the result that the works were now in good order. On this subject, the shareholders might have seen last April a rather alarming report in the Press to the effect that a severe tornado had occurred in Calcutta. He was happy to say that the subsequent statistics showed that the first reports had been exaggerated, and were not justified. Although there was severe damage in the city, the Company sustained no damage whatever. To the carbonizing plant, additions and improvements had been made, and now the manufacturing power was fully equal to what might be taken as the maximum demand practically possible, so that they were now ready to meet the requirements of consumers to any extent anticipated. The next matter was that a contract had been entered into with the Municipality of Cossipore-Chitpore for the exclusive public lighting for a period of twenty years. This was a gratifying incident. It was not only remunerative of itself, but it was an extension of business which enlarged the basis and lightened the burden of fixed charges which were incidental to the whole undertaking. As the Directors said, the contract was exclusive—that was to say, gas would be, and would remain, the sole illuminant of Cossipore-Chitpore for the public lighting until the year 1934. He regarded it as a significant indication of the trend of public opinion that a modern and enlightened municipality—having literally before their eyes, in the adjacent thoroughfares of Calcutta, facilities for observing gas and electricity side by side in actual use, and of gauging their respective merits—should not only have declared in favour of the veteran illuminant, but have secured its supply for twenty years yet to come.

WHAT OF THE FUTURE?—A TRIBUTE TO INDIA'S MANHOOD.

So much for the past. What of the future? He did not mean the remote and ultimate future after the conclusion of the terrible war. As to that, he need not say anything beyond this, that he was fully confident England would emerge victorious, and with a bright future of many years assured peace before her. What he meant was the immediate future of the new financial year on which they had entered. More than half of the habitable globe was at the present moment at war, each combatant intent upon either capturing or destroying the enemies' trade and commerce, which were the vital sinews of a nation's strength. Looking at a map, he saw that the Powers that ruled three-fourths of Europe, the whole of Asia (with the exception of Persia and the Chinese Empire), the whole of the settled portion of the Continent of Africa, the larger moiety of North America, and the whole of the fifth Continent of the world—Australasia—were engaged in war. It was inevitable that the peaceful pursuits of merchants and manufacturers other than those engaged in the production of munitions and appliances of war should undergo some temporary eclipse—that with so wide-spread an area of active hostilities, it seemed to be utterly impossible that one single spot could escape untouched by the malign consequences of this horrible struggle. They could not therefore expect that India would enjoy complete immunity. He spoke to the shareholders last year of some great projects for the development and aggrandizement of Calcutta which were about to be undertaken. These, he now feared, and other commercial enterprises then contemplated, might be set back, and have their accomplishment retarded. The vast trade of Calcutta in general would no doubt suffer some dislocation or abatement, and perhaps all commercial undertakings would feel the effects in some greater or less degree. But he trusted that this arrest of activity would not be of very long duration. There were those who believed that, with the re-establishment of peace, there would be a great commercial revival—a trade boom in fact. Whether or not there would be, they could not tell; they could only hope that the forecast might be an accurate one. The Directors were powerless to alter these things. But as men of business, the Board would continue to keep their attention riveted on the Company's affairs and interests; and they would do their utmost to promote its welfare and prosperity. He should not like to sit down without referring for a moment to the splendid loyalty of the Indian peoples of all ranks, races, and creeds, and to the heroic deeds of arms performed by their magnificent troops. When he figured to himself these men standing shoulder to shoulder with our own brave lads, and charging the common foe, he could not conceive of anything more admirably calculated to link East to West, English with Indian, both members of the same great Aryan family, with ties of affection, esteem, and regard for each other. He would only add that the Company's appreciation of their gallantry had taken the concrete form of a subscription to the Indian Soldiers' Fund. ["Hear, hear."]

Mr. A. T. EASTMAN seconded the motion, which was carried unanimously.

The CHAIRMAN moved the declaration of a dividend of 8 per cent., free of income-tax, less the 3½ per cent. already paid on account. He remarked that it was very gratifying that they could pay the dividend free of income-tax—income-tax at the rate as it was of 1s. 3d. made the payment equivalent to a dividend of 8½ per cent. He did not know what would happen in the future; but if income-tax was going to continue to rise, they might have to reconsider the question of paying the dividend free of income-tax. This had not been discussed at the Board; it was only a point that had crossed his mind since he had been on his feet.

Mr. STANLEY H. JONES seconded the motion, which was unanimously adopted.

Moved by the CHAIRMAN and seconded by Mr. W. WILLIAMS, Mr. Robert Miller and Mr. Stanley H. Jones were re-elected Directors of the Company.

Proposed by Mr. WILLIAM RICHARDS, and seconded by Mr. W. C. ELLISON, the Auditors (Messrs. S. W. Savage and Frederick Seel) were re-appointed.

The CHAIRMAN moved a hearty vote of thanks to the staff, both in London and in India. He referred to the painstaking work of Mr. Luff, and to that of the Accountant (Mr. Rainer); and also spoke of the excellent services of Mr. Snelgrove, the General Manager in India, with whom the Board had had the pleasure of having several interviews while he was at home on leave last summer. Complimentary references were also made to the work of the other members of the staff in Calcutta, and to the loyalty of the Indian employees.

Mr. J. H. MACKAY, in seconding, asked to be allowed to associate the Chairman and Directors in the same vote.

This was assented to; and, so extended, the motion was very cordially agreed to.

The CHAIRMAN'S response, on behalf of all included in the vote, terminated the proceedings.

THE GAS-WORKERS' STRIKE AT NEATH.

Effect on the Gas Supply.

There were further developments during the past week in connection with the strike of employees of the Neath Corporation. As recorded on p. 440 of last Tuesday's "JOURNAL," the men struck work for the purpose of enforcing a demand made through the Municipal Employees' Association for an increase 3s. per week in their wages; and the result was, among other things, to cause much inconvenience to gas consumers over the week-end. On Monday night, things were no better—the town being again without illumination, except from a few electric lights outside business premises. The gas-power tramway service was stopped all day; and works where gas-engines are installed were in a similar plight. Further men were imported through the medium of the Free Labour Association of Manchester; but it is said that they were unable to turn out any gas, and several of them soon deserted. Referring to the strike, a local paper said on Wednesday that "on Monday night the 'imported' labourers at the gas-works were assisted by a number of members of the Neath civic guard, all of whom were under the protection of armed police. The amateur gas stokers included a young solicitor, a dental surgeon, a bank clerk, and two master builders. But they were unable to manufacture any gas. Yesterday their combined efforts resulted in the production of only a few thousand cubic feet. Business premises, offices, schools, &c., were again closed last night as soon as daylight disappeared; and shopping was done by candle-light and oil-lamps. Temporary assistance was requisitioned for heating the schools, where the caretakers are also on strike. Dancing classes and meetings at the Town Hall were abandoned, as were the week-night services at churches and chapels."

Early on Monday, Mr. Rees Llewellyn (the Secretary of the Municipal Employees' Association) informed the Town Clerk that he was prepared to enter into negotiations with the Council, if they desired it. As a result, a meeting of the Gas Committee was held in the afternoon; and an hour later a message was sent to the men that the Committee would receive a deputation. Several of the men, with Mr. Llewellyn, immediately attended, and the conference lasted nearly two hours. The men announced that they were prepared to modify their terms and accept 1s. 6d. instead of 3s. weekly advance. The deputation then withdrew, and after another hour's consultation in private, the Committee, without having reached any decision, adjourned the meeting until the evening. Another long deliberation then took place; and at its close the following statement was issued to the Press:

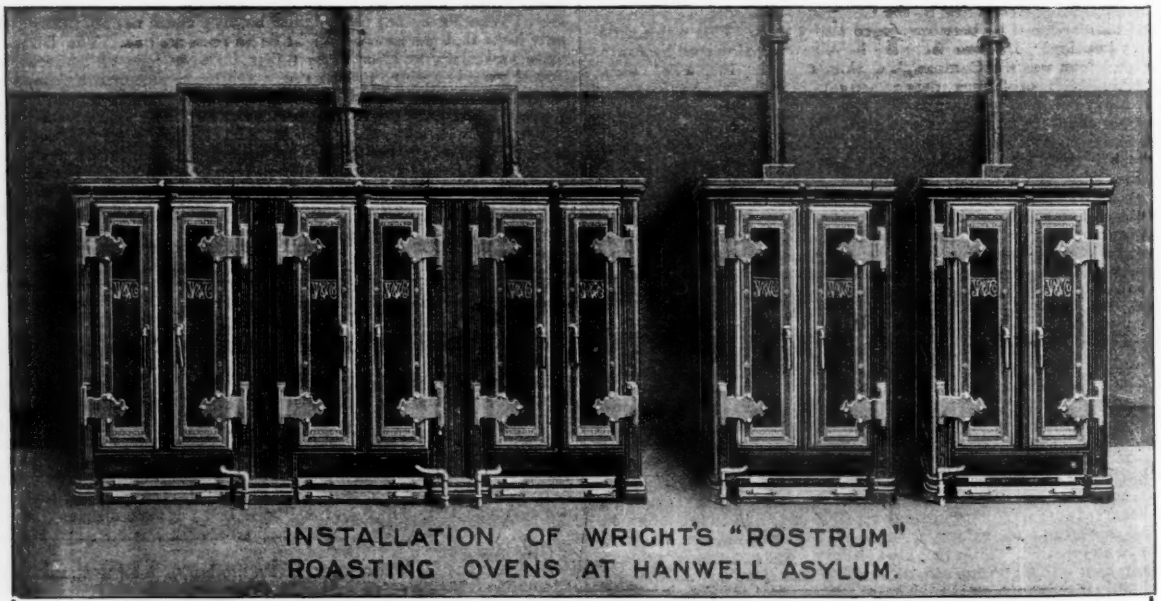
> The Committee, having met again, are of the opinion that the Corporation employees had been paid fair and reasonable rates of wages compared with what are paid by the great majority of local authorities and gas undertakings in South Wales. They further consider that the men had treated the Corporation, as representing the inhabitants, both unfairly and without justifiable excuse, causing the residents very serious loss and inconvenience in a variety of ways. Moreover, at this time of grave national crisis, they feel that the men ought not to put forward a claim for a general advance on the present remuneration. Under all the circumstances, the Committee feel that they have no alternative but to adhere to the decision already conveyed to the men, and to decline the application put forward by them, and to add that the Corporation have always been well disposed towards their employees, and had never treated them without due consideration in the matter of wages and conditions of labour. But if there are any special grievances which they think call for immediate remedy, the Committee would be prepared to consider them on hearing from the Secretary of the men's Association.

During the following day, no sign was to be seen that either side was prepared to give way. A manifesto was issued by Mr. Llewellyn on behalf of the men, pointing out that negotiations with the Council on various matters were carried on for twelve months; but the applications were rejected. The men then renewed their demand for an increase of 3s. per week in wages; but this, it was alleged, was treated in a "hide-and-seek" fashion, which aggravated the situation.

On Thursday night an effort was made to resume the supply of gas to tradespeople and private consumers; members of the town guard again assisting as stokers at the gas-works. The quantity of air that had accumulated in the pipes, &c., however, militated against the success of the effort to restore the light. A reply was issued by the Corporation to the manifesto of the men. The statements made by the men were described as "grossly misleading," and the strike as "without any justification."

At the end of the week, it was announced that a settlement had been effected, and that the men had returned to work. The matter is to be referred to the Board of Trade for arbitration; and both sides will accept the award.

Gas-Works Extensions at Stafford.—At the Guildhall, Stafford, last Tuesday, Mr. H. R. Hooper, M.Inst.C.E., held an inquiry, on behalf of the Local Government Board, into an application by the Corporation for a Provisional Order to authorize the use of certain land for the manufacture and storage of gas; also to increase the pressure of gas, and to substitute a calorific standard for the present illuminating power standard. There was a further application for sanction to borrow the sum of £20,000 for the provision of vertical retorts. The Gas Engineer and Manager (Mr. W. M. Valon) said it was proposed to erect another holder. At present they could make 1,000,000 cubic feet of gas per day, but on one day last year they had an output of 1,200,000 cubic feet. The new vertical retorts would not be sufficient to make the whole of their gas in the winter; and they would then use the existing plant as an auxiliary. There was no opposition to the application. In the course of the proceedings, the Inspector expressed the opinion that, in the interests of both concerns, there should be separate Committees for the gas and electricity undertakings.



INSTALLATION OF WRIGHT'S "ROSTRUM" ROASTING OVENS AT HANWELL ASYLUM.

This battery is composed of five ovens, each 6 ft. high and 3 ft. 9 in. wide.

Estimates for special Cooking Apparatus, suitable for Large Institutions, will be sent on receipt of particulars of requirements.

JOHN WRIGHT & CO., Eureka Works, BIRMINGHAM.

THE LIGHTING OF LONDON.

At a meeting of the Balham and Tooting Traders' Association on Friday, a letter was read from the South Metropolitan Gas Company stating that it had been decided to make no charge in respect of the outside lamps of traders' business premises, but that there would be a charge of 6s. 9d. per lamp per quarter towards the cost of maintenance. It was the desire of the Company that the lighting order should not involve the discharge of employees. The Company were losing at the rate of £400 per month even on this basis. The Chairman (Mr. Harry Cusden) remarked that the Wandsworth and Wimbledon Gas Company, who served part of the district, were making a similar charge per outside lamp—2s. 3d. per month. It was decided to take no further action in the matter at present.

The Islington Borough Council have adopted a resolution that, in their opinion, the diminution of public street lighting is a source of public danger, and that, having regard to the prevailing darkness in many of the main streets of the Metropolis during the earlier hours of the evening when there is considerable traffic, representation be made to the Government and the Chief Commissioner of Police to sanction such an improvement of the lighting of public thoroughfares as may be commensurate with the reasonable protection of London at this time of national peril. They invited other Metropolitan borough councils to join them in their appeal to the Government; but the Southwark and Lambeth Borough Councils have decided to take no action. The Lighting Committee of the latter authority point out that the Home Secretary in the House of Commons, in reply to questions, stated that the regulations had been relaxed so as to allow shops to remain brightly lighted until 6 p.m., and that they will still further be relaxed as soon as the Admiralty advise that this can be safely done.

NOTTINGHAM AND GERMAN MANTLES.

Quite a mild sensation was created in Nottingham last week by attempts made in the local Press to stir up wrath against the Public Lighting Committee. The allegation of trading with the enemy in relation to the allocation of contracts for German-made mantles formed the gravamen of the suggested offence; the newspapers being full of letters of righteous indignation.

"A Disgusted Citizen" initiated the correspondence by the statement (upon so-called "unimpeachable authority") that the City Lighting Committee had a few days previously placed large orders for mantles made in Germany, "while ignoring the tenders for British-made mantles, equally low in price, and quite as good." An appeal was made for a removal of this "stigma" from the records of the City Council. Subsequent contributions to the controversy engendered even greater heat; disgust being freely expressed at the action of the Committee. It was urged by one writer that, if it were impossible to obtain this class of goods elsewhere, the Committee were not justified in their action of buying articles made by the Germans. A point of local interest was also mentioned, in that cotton mantles before treatment are made for English companies by a firm in Nottingham.

The vituperation which it had been sought to pour upon the heads of the Committee has entirely lost its sting by reason of the explanation which was forthcoming in a letter on Thursday from Mr. R. A. Young, a local legal practitioner, who succeeded the late Alderman J. P. Ford in the chairmanship of the Lighting Committee. Therein, in a spirit of mild rebuke to the Editor of one of the local journals, Mr. Young declared: "The impression created by your article, and the correspondence on this subject, is slightly misleading. The Nottingham Lighting Committee did not (nor would) trade with any alien enemy. Owing to the war, it has only been possible to obtain mantles from actual stocks or persons holding the necessary raw materials and in a position to manufacture. All samples submitted were tested; and the only mantles bought, as a result of these tests, which may prove to have been of German origin, were some part of the stock of a local tradesman who had held them since before the war (*sic*), and presumably had paid for them long prior to its outbreak. These were originally manufactured under the trade mark of the Nottingham Ironmongers' Association." Mr. Young's explicit statement has cleared the air to a large extent; but it is understood that the matter will be brought under notice at the next meeting of the City Council.

ENEMY PATENT RIGHTS.

List of British Patents Granted to Germans and Austrians.

By virtue of the provisions of the Patents, Designs, and Trade Marks (Temporary Rules) Act, 1914, any person may apply to have any of the hereunder patents revoked or suspended, providing that such person applying can satisfy the Board, or any person whom they may appoint for the purpose, that the patentee or licensee is the subject of a state at war with His Majesty, that such person applying intends to manufacture, and that such revocation is in the general interests of the country or of a trade. The list is contributed by Messrs. Hughes and Young, Patent Agents, of 55 & 56, Chancery Lane, W.C., who will furnish readers with any further information they may require.

13,603 4-5 (1913).—Berlin-Anhaltische Maschinenbau, "Actuating gas-valves."
14,241 (1913).—H. Gossler, "Burners."
14,757 (1913).—Gas-Zunder-Ges., "Lighting burners."
15,037 (1913).—Julius Pintsch Akt.-Ges., "Lamps."
15,064 (1913).—F. Russe, "Detecting gases."
15,081 (1913).—Julius Pintsch Akt.-Ges., "Incandescent burners."
15,082-3-4 (1913).—Julius Pintsch Akt.-Ges., "Gas lighting."

Further "Lancet" appreciation

of

The Davis Gas Stove Co., Ltd.

"These makers introduced the hygienic test known as the Shadowgraph Test, so that they took the initiative in excluding gas fires which did not satisfy this test. In other words, they commenced the movement for condemning gas fires which allowed combustion products to escape into the room. Under these circumstances it seemed superfluous to test their own models. However, it is interesting to record that the 'Lancet' hygienic test was found to confirm the findings of the Shadowgraph Test, the standard which they adopted. There was no leakage of combustion products from these fires even when unaided by an elbow or lengths of flue pipe. The complete passage of the combustion products through the flue nozzle was demonstrated and the process is automatic. **The firm is much to be congratulated on its pioneer work.**"

The "Lancet," 14 Nov., 1914, p. 1162.

WOODALL-DUCKHAM VERTICALS AT SPALDING.

There was recently submitted to the Gas Committee of the Spalding Urban District Council by Mr. H. R. Wimhurst (the Engineer and Manager) a report on the working of the Woodall-Duckham vertical retorts, which had then been in operation just twelve months. The plant was started-up in October of last year; and since then vertical retort gas only has been supplied, the horizontal plant having been shut down. The report was submitted as an interim one, as, owing to the financial year not ending until March next, it was impossible to give information about fuel, residuals, &c.; neither does it represent the utmost the plant is capable of doing, as it took a month or two to get the plant and the men properly "tuned-up" to their work. The installation, which is the smallest that the Woodall-Duckham Company have erected, has a nominal capacity of 240,000 cubic feet a day, though, when pushed, 310,000 cubic feet have been obtained from it. There are two settings of two retorts. Coal and coke are elevated by means of a belt-driven lift. It is found that two men can operate the plant per twelve-hour shift—taking coal from the store to placing the coke on the coke stack, and attending to the boilers and exhausters. Carbonizing wages for the past month have been at the satisfactory figure of 11·3d. per ton, with the plant working to full capacity.

Comparing in his report the last half year of the horizontal retort working with the corresponding period of the Woodall-Duckham vertical retort working (when the installation had fairly "got into its stride"), Mr. Wimhurst said that for the six months ended Sept. 30, 1913 (with horizontals), the make of gas was 22,627,000 cubic feet, the coal used 2110 tons, and gas made per ton 10,718 feet. For the half year to Sept. 30, 1914 (with verticals), the gas made was 26,253,000 cubic feet (an increase of 3,626,000 feet), the coal used 2146 tons (an increase of 36 tons), and the gas made per ton 12,233 cubic feet (an increase of 1515 feet). The gain on the first year's working of the vertical plant, over the last year of the superseded horizontal retorts, works out as follows: Decrease in labour costs, £225; increased sales of gas, £446; total, £671. Deducting £265, for interest and loan repayment, there has thus been effected by the new plant a net saving of £406.

Newcastle (Staffs.) Gas Department and the Renewal of Mains.—At the last meeting of the Newcastle (Staffs.) District Council, Mr. J. Mottram (the Gas Engineer) submitted a report on the undertaking, and recommended that the Council use only Mannesmann steel tubes when renewing the mains. He stated that this would give greater satisfaction to their district, and also keep down the leakage account. The Chairman of the Gas Committee (Mr. Dean) agreed. It was resolved that the question of renewing the mains, and other matters connected with the gas undertaking, be deferred for the consideration of a special meeting of the Council to be held before Christmas.

GAS COMPANIES AND SULPHURIC ACID MANUFACTURE.

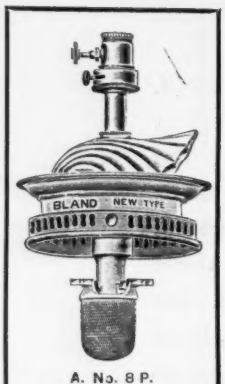
Referring to this matter, which was dealt with in our editorial columns on the 17th ult., the "Chemical Trade Journal" last Saturday made the following remarks: "At a recent meeting of the South Suburban Gas Company, Mr. Charles Hunt, who presided, referred to the action of the Alkali Manufacturers' Association concerning the purchase of residuals by gas companies, and said that sulphuric acid was, or could be, made from spent oxide, but its supply was still very much in the hands of private chemical manufacturers, who appeared to have been making a very good thing out of it. Messrs. Spencer Chapman and Messel formerly supplied the Company with sulphuric acid, their lowest price for which, down to the year 1908, was 47s. 6d. per ton. In that year, however, the South Metropolitan Gas Company appeared upon the scene as acid manufacturers, and Messrs. Spencer Chapman and Messel's price fell at once to 29s. 9d.—a reduction of 17s. 9d., or about 36 per cent. In fixing this figure, they seemed to have over-estimated the ability of the South Metropolitan Gas Company to compete; and so they went to Sir George Livesey, then the Chairman of the Company, who gave them an additional 5s. per ton, making their price 34s. 9d. per ton, or still about 27 per cent. less than their previous one. At the same price they also obtained the Company's contract in the two following years. But in 1911 the South Metropolitan Company, having in the meantime improved their plant, offered to supply at 32s. 6d. per ton, and were given the contract at that price. As compared with the price of 47s. 6d. which ruled in 1907, the action of the South Metropolitan Company in embarking upon the manufacture of this acid had—while doubtless profitable to that Company—saved the South Suburban Company no less than £7200. The tinplate industry must also have benefited largely from the fall in the market."

The "Engineer" for the same date made the following observations on the subject: "In the course of a leading article the 'JOURNAL OF GAS LIGHTING' makes the suggestion that gas companies should take up the manufacture of sulphuric acid on a large scale. Gas undertakings, says our contemporary, have a very good reason indeed, providing they are on a sufficiently large scale, for making sulphuric acid on their own account. But all gas companies, though producing spent oxide, are not individually large enough to manufacture sulphuric acid, and all do not convert their ammoniacal liquor into sulphate of ammonia. Many gas undertakings are perfectly qualified to enter upon its manufacture on their own account. But there is still another way in which the share or stock holders of the smaller companies may take up the manufacture—that is, by private enterprise; in other words, by the formation of an independent manufacturing company or companies capitalized by the private money of gas shareholders, which company or companies would be quite of ordinary manufacturing and trading character, just as free from restrictions as are the present makers of sulphuric acid, and so competing with them on terms of perfect equality. Even larger gas undertakings might find it more

BRITISH LABOUR!! BRITISH CAPITAL!!

NO ADVANCE IN PRICE.

THE ORIGINAL "SHELL" TYPE BURNER.



A. No. 8 P.
With White or Green Porcelain Shell.

REFUSE IMITATIVE DESIGNS.

THE BLAND PATENT BURNER

with combined Bunsen Tube and Nozzle gives a duty of 93 Candles at a consumption of 3·50 cubic feet per hour at a pressure of 30/10ths.

THE BLAND LIGHT SYNDICATE, LTD., LONDON & MANCHESTER.

economical to take advantage of such a scheme than manufacture on their own account, as, of course, a small plant cannot possibly work so economically as one of larger capacity, and one capable of meeting the requirements for different grades of acid."

BOLTON CORPORATION WATER SUPPLY.

Objections to the Meter System.

At a recent meeting of the Bolton Progressive League, the members were addressed on the subject of a municipal water service, by Mr. LEWIS MITCHELL, the Borough Water Engineer.

In his address, which was fully illustrated, Mr. Mitchell said Bolton used 24 gallons of water per head per day, of which 16 gallons were for domestic and 8 gallons for trade purposes. The water-works of Bolton now supplied 7,500,000 gallons per day. If the drainage area were not sufficiently remote from the inhabited centres, it was difficult (even when absolute control had been secured by purchasing the lands) entirely to prevent pollution. In such a case it was essential, since cultivation of the land and ordinary farming operations were incompatible with the preservation of the purity of the water, to clear off the farms from the catchment area, remove all human habitations from it, and prevent (or reduce as far as practicable) the incursion of the public over it. It was, however, generally preferable in all the circumstances to import a water supply from a distant but uncontaminated and comparatively unrestricted area, notwithstanding the extra cost involved for the longer aqueduct necessary.

It was frequently urged that water supplies should be given, not only for trade, but for domestic and all purposes, by measurement, so as to avoid inequality of treatment, and as a check upon waste and misuse. But there were numerous objections to this proposal, the chief of which was that it would tend to restrict the legitimate and necessary use of water, and discourage habits of cleanliness. A further serious objection to the introduction of the house-meter system was the amount of capital value involved, which, in a town like Bolton, would not be less than £100,000. In addition, there would be the cost of inspection and repair of meters; so that there would be a total expenditure which would not fall short of an average annual water-rate.

Newton-le-Willows Gas Supply.—At the last meeting of the Newton-le-Willows District Council, a letter was read from the London and North-Western Railway Company's waggon works at Earlestown, complaining of the quality of the gas supplied. They alleged that in consequence of this the work they were doing for the Government was being delayed. Mr. R. T. Surtees (the Gas Engineer) explained that they had been working under tremendous difficulties, owing to the calls made on their stokers by the war. The matter was referred to a Sub-Committee; the members of the Council meanwhile arranging to visit the gas-works during the present week.

NOTES FROM SCOTLAND.

From Our Own Correspondents.

Saturday.

The gas supply of Dundee has lately given rise to complaints by the inhabitants, and there was a long discussion on the subject at the meeting of the Gas Committee of the Corporation last Tuesday. The Convener (Mr. Noble) explained that there had been some delay in the completion of the new vertical retorts, as the contractors had so much Government work on hand. But a half-bench was now fully charged; and they expected to have the other half completed by the middle of next month. In changing-over from one plant to another it was very difficult to keep the supply of gas uniform all over the town, especially when they had whole sections shut-down and others only half-going. Besides, they had an order from the military authorities that a number of the public lamps were to be put out; and then there was another order that if the lamps were blackened they could all be kept alight. It was with these orders and the new plant that the difficulty had cropped up. Mr. Macdonald said it was not the public lamps but the gas used in the houses that was complained about. It was absolutely inferior. The Gas Engineer and Manager (Mr. Alex. Yuill) explained that at the end of the year difficulty was always experienced with naphthalene; and it seemed a strange irony of fate that just when they were almost in a position to cope with the difficulty they should have an outbreak worse than they had ever experienced. In a good many cases it was the pressure that was at fault, as the quality of the gas was the same over all the city. The war had aggravated the trouble, as, owing to the number of men joining the Army, they had 15 fewer gas-fitters than formerly, so that they could not deal with complaints so rapidly. But they were getting over the difficulty. After some conversation the subject dropped.

The abstract of the accounts of the Kilmarnock Gas Department for the year ended the 15th of May last has been issued. It shows that the total income was £35,921, and the expenditure £30,348; leaving a balance of £5573 to go to the profit and loss account. This sum added to the amount brought forward made a total of £12,951. After meeting loan charges, &c., there remained a balance of £7893 to be carried forward. The quantity of coal carbonized was 22,460 tons; and the make of gas was 211,056,700 cubic feet, or an average of 9397 cubic feet per ton of coal. The unaccounted-for gas was 7·3 per cent. of the make. The sale of gas produced £24,115; of coke, £5122; and of tar and sulphate of ammonia, £5742. Other sales made up a total of £11,806, which added to the receipts for gas made the total revenue of £35,921 already given. There was expended on capital account during the year a sum of £4746, of which £2720 was for cooking and heating appliances. The works are under the joint management of Messrs. W. & C. Fairweather.

Steps are being taken to reduce the lighting on the west coast of Scotland. At a recent meeting of the Port Glasgow Town Council, a letter was read from the Secretary for Scotland with reference to the

Lady Crossley's Hospital.

The Phœnix.

The proof of the hygienic value of

Clark's Syphon Stoves

is the fact that many hospitals are heated with these stoves.
In addition to the 95 fixed in Welsh Hospital, Netley, the Military Hospital, Norwich, temporary barracks, &c., we are now able to announce that

Lady Crossley's Hospital

for Soldiers and Sailors has had Clark's Stoves installed.

We can despatch immediately.

Clark's Syphon Stove Co., Ltd.,
Warrington and London.

restricted lighting for the burgh. The communication stipulated that arc lamps as well as other lights along the river front must be reduced and darkened. People who occupy premises facing the Clyde are requested to draw-down their window-blinds; while the illumination of shop fronts and picture-houses must also be reduced or screened. At a special meeting of the Dunoon Town Council, it was agreed to extinguish all the lamps on the shore side of the town except all-night lamps, which will be darkened on that side, and to extinguish every alternate light in other parts of the town. The pier lights will also be curtailed; and shopkeepers are being asked not to light their windows or doors, while householders with windows facing the Firth of Clyde are asked to keep them screened.

Considerable interest has been taken in operations on the estate of Kincraig, the property of Mr. Thomas Reid, Aberdeen, for providing a satisfactory water supply to certain of the holdings, the want of which has been long felt. Some four months ago, Mr. Torn, a diviner, was called in to ascertain whether water was likely to be obtained on the higher parts of the estate; and he located a strong spring. Afterwards Mr. A. M'Bain, a water engineer, who is also a diviner, was consulted, and he fixed on almost the same spot as that indicated by Mr. Torn. Encouraged by this confirmation, Mr. Reid instructed Mr. M'Bain to dig a well; and though for a while the operation seemed likely to be worthless, Mr. M'Bain's confidence in the divining-rod led to his continuing operations till, at a depth of 47 feet (the last 27 feet being through rock), water was found. It proved to be sufficient in quantity for all probable requirements, and excellent in quality. Mr. Reid then proceeded with a scheme to pump the water to a cistern at a higher level, from which it would be distributed by gravitation. Mr. M'Bain was entrusted with the carrying out of this work. The supply was turned on in full force last Saturday, and the works were inspected by Mr. Reid and his factor, and found to be in good order. The water is raised by a powerful "Clutha" windmill, and is forced for a distance of 250 feet into a concrete tank capable of holding 3000 gallons. From this upwards of a mile of piping has been laid in various directions, and provision made for extensions.

A Re-Building Scheme at Weston-super-Mare.—An extraordinary meeting of the Weston-super-Mare Gas Company has been held to sanction the creation and issue of £15,000 of 5 per cent. maximum consolidated ordinary stock, required in connection with a re-building scheme for the Company's works. Mr. J. E. Norman, J.P., who presided, stated that the scheme (which would call for the raising of another £4000 or £5000 at a later date) would be in operation between March and June next year; and there could be no doubt that as a result the Company would reap very great benefit. They would be able to pay all the additional interest on the new capital raised, and be in possession of economical and valuable plant sufficient for all their requirements for many years to come. The resolution authorizing the issue was carried unanimously.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Nov.* 30.

The London market for tar products remains practically in the same position as last week. Carbolic acid is very firm, and 3s. 2d. net, casks free, for 60's crude has been done for prompt delivery. Other prices are as follows: Creosote is firm at 4d. per gallon, net in bulk alongside export steamer; pyridine bases, 8s. to 8s. 3d. per gallon net into buyers' packages; anthracene, 40-45 per cent., 2d. per unit net, casks free.

Sulphate of ammonia is still unchanged; makers' quotation for 25 per cent. quality being £10 17s. 6d. per ton net and naked at works.

Tar Products in the Provinces.

Nov. 30.

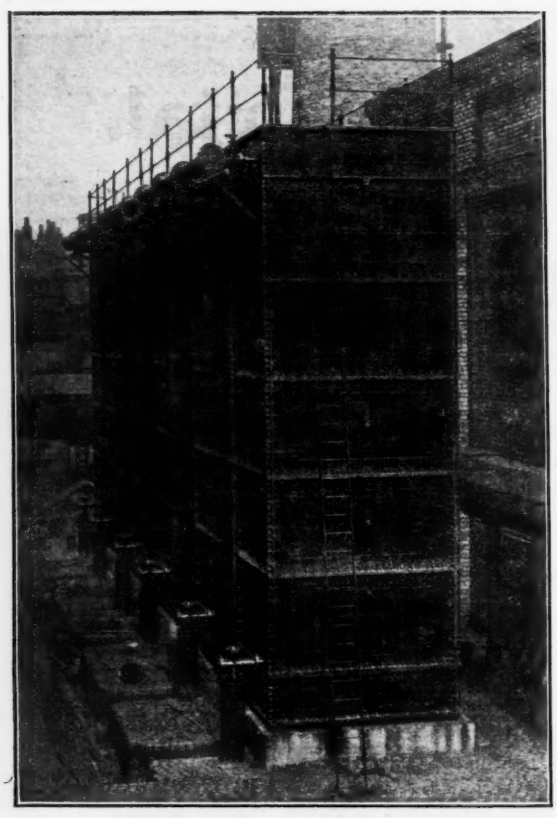
There is practically no alteration in the markets for tar products. Pitch is very difficult to sell. Benzols are quiet, and reasonable prices are being accepted. Solvent and heavy naphthas are steady, though there is not much new business. Toluol is very firm. Good prices have been paid for crude carbolic for delivery over the whole of next year. Creosote remains steady, and there is a fair amount of inquiry.

The average values during the week were: Value of liquid products in one ton of tar, 16s. 6d. to 18s. Benzol, 90 per cent., naked, North, 8½d. to 9d.; 50-90 per cent., naked, North, 1s. 3d. to 1s. 4d. Toluol, naked, North, 2s. 6d. to 2s. 8d. Crude naphtha, in bulk, North, 5½d. to 6d. Solvent naphtha, naked, North, 8½d. to 9d. Heavy naphtha, naked, North, 11d. to 1s. Creosote, in bulk, North, 3⅜d. to 3 7/16d. Heavy oils, in bulk, 4d. to 4½d. Carbolic acid, casks included, 60 per cent., East and West coasts, 3s. to 3s. 1d. Naphthalene, £4 10s. to £10; salts, 60s. to 65s., bags included. Anthracene, "A" quality, 2d.; "B" nominally ¾d.

Sulphate of Ammonia.

LIVERPOOL, *Nov.* 28.

Throughout the week the demand for this article has continued good, and all available supplies have been readily absorbed at a further increase in values. A certain amount of the purchasing has been for the purpose of covering old contracts, but there have also been considerable new orders in the market from direct buyers. The closing quotations are £11 per ton f.o.b. Hull, £11 2s. 6d. per ton f.o.b. Liverpool, and £11 5s. per ton f.o.b. Leith. For future delivery several transactions have been reported at £11 7s. 6d. per ton for January-March, and £11 5s. per ton for January-June f.o.b. good port; and in some instances makers are now asking more money.



REVERSIBLE WATER CONDENSERS ERECTED TO THE DESIGNS OF J. G. NEWBIGGING, ESQ., M.INST.C.E., MANCHESTER.

WATER-COOLED CONDENSERS

AS FITTED WITH THE **"BEARSCOT"** SAFE JOINT TUBE.

With our Central Port Fourway Valve the Condensers may be Reversed or Bye-passed as Required.

PARTICULARS WILL BE SUPPLIED UPON APPLICATION TO—

R. & J. DEMPSTER, LD.

Telegrams: Scrubber Manchester."

MANCHESTER.

Nitrate of Soda.

The market for this material remains quiet, and the values on spot are now 9s. 6d. per cwt. for ordinary and 10s. for refined quality.

Sulphate of Ammonia.

From another source it is reported that the market has been a little steadier during the past week, and at some ports the prices are a trifle better. Outside London, makes are quoted at £10 to £10 2s. 6d.; Hull, £10 15s. to £10 16s. 3d.; Liverpool, £10 16s. 3d. to £10 17s. 6d.; Leith, £10 17s. 6d. to £11; Middlesbrough, £10 16s. 3d. to £10 17s. 6d.

COAL TRADE REPORT.

Northern Coal Trade.

The coal market is still kept dull by the high freights that have to be paid. To London 6s. is now the ruling rate, and to Rouen about 12s.—figures which are double those that were known a year ago. Other freights are similarly high, and buyers abroad hesitate to pay such an advance. The effect is most seen on the exports; and the steam coal collieries are working short time, although the number of miners is further reduced by enlistment. Best Northumbrian steams are 13s. per ton f.o.b.; second-class steams are 10s. 6d. to 10s. 10d. per ton; and steam smalls vary from 7s. 3d. to 9s. per ton, according to quality. In the gas coal trade, there is now a strong home demand; while to France and Italy the inquiry is fairly full. The work at the gas coal collieries is about the best in point of output. Best Durhams are 12s. 6d. per ton f.o.b.; second-class gas coals are quoted at 10s. 9d. to 11s. per ton; and "Wear Specials" are steady at 13s. per ton f.o.b. The inquiry is good for gas coals, especially for the best qualities, and deliveries on contracts are maintained. But there is not much new business being done forward; both buyers and sellers being cautious in committing themselves forward with present costs of transport. Coke is generally steady. Gas coke is plentiful, and in some cases easier; the quotation generally being from 11s. 6d. to 12s. per ton f.o.b. in the Tyne for good makes.

We have received from the British Empire Industrial League, of 55 and 56, Chancery Lane, a series of tabulated statistics showing the extent and value of the export trade of Germany and Austria. They have been compiled from the latest available official resources, and they are submitted as being absolutely reliable. The object of the League in issuing them is to supply in a handy form to manufacturers, exporters, and merchants, information that will assist them in attacking and capturing the commercial strongholds of the two countries named.

Pit-Sinking by the Simon-Carves Company.

We are informed that Simon-Carves, Limited, of Manchester, the well-known coke-oven and coal-washing engineering firm, have started a new mining department to deal principally with the sinking of pits by the freezing and cementation processes. This department is under the management of a Belgian mining engineer, who had had a long experience in this class of work. The firm have also obtained a first contract for the sinking of two shafts.

Lighting of the Close of St. Peter, Westminster.

At the Westminster City Council meeting, last Thursday, the Works Committee reported that the Dean and Chapter of Westminster had approached the Gas Light and Coke Company with a view to obtaining better terms for the maintenance and lighting of the lamps in the Close of St. Peter than were contained in the contract with the Company entered into in 1903, and in force until Sept. 30. The Company had agreed to revise their charges, and had entered into an agreement covering a period of five years from Oct. 1, and for a possible further period of five years. The agreement provides, *inter alia*, that the Company will maintain the lighting during 3940 hours per annum, in accordance with the daily schedule of lighting in use for the public lamps in Westminster. A specified candle-power is to be maintained; and the Company are to pay 1s. per day or portion thereof for every lamp giving less than the specified power. By the agreement, lamps of 90-candle power are to be provided, at an annual charge of £3 4s. per lamp, in place of lamps under the superseded agreement giving an average candle power of 20, which, on the average, cost £3 15s. per annum. The report was received.

Spalding Gas Charges.—Dissatisfaction is felt in the Lincolnshire market town at the price charged for gas for motive purposes; and upon the basis of a contention that the Council are now producing gas at a much lower cost, a reduction is asked for as being overdue.

The War on Germany's Trade.—At the meeting of the Cardiff Technical Schools Committee last Wednesday, the Superintendent of Technical Instruction (Mr. Charles Coles) submitted a proposal for a general conference in the City Hall on the question of the extension of British trade in colonial and neutral markets, and the subsequent delivery of special lectures by experts in connection with certain industries. It was stated that the Lecturer in Metallurgy (Mr. R. H. Greaves, M.Sc.) would be prepared to give six lectures on "Coal and its Bye-Products;" and that Mr. George Clarry, the General Manager and Secretary of the Cardiff Gas Company, who, as already announced in the "JOURNAL," has recently been elected a member of the Education Committee, had promised to give assistance in the direction of securing experts to lecture on the gas industry, including bye-products, gas-fittings, and mantles.

THE "LANCET" REPORT ON PARKINSON GAS FIRES.

"These were all well designed and attractively finished fires, and not one of them showed the slightest escape of combustion products, either when tested in the open, unattached to a chimney, or when unprovided with a flue or elbow. We regard these fires, therefore, as being satisfactory from the hygienic point of view."

(Extract from the *Lancet*, Nov. 14th, 1914.)

PS

THE PARKINSON STOVE Co., Ltd.,

BIRMINGHAM AND LONDON.

Coke Sales in the Potteries.—At the last meeting of the Stoke-on-Trent County Borough Council, it was resolved that for a period of one month the price of coke be reduced to 12s. 6d. per ton for local sales, less 5 per cent., one month; and that the Chairman and Mr. W. Langford (the Chief Gas Engineer) be empowered to accept offers from outside buyers for large quantities, provided they were satisfactory in price.

Portsmouth Water Company.—At the half-yearly general meeting of this Company on the 19th ult., the Directors reported a balance of £27,772 on the profit and loss account for the half year ended the 30th of September, and they recommended the declaration of the full statutory dividends. After providing for void houses, there would then be a balance of £7894 to be carried forward. The quantity of water supplied during the half year was 1,677,004,803 gallons, equal to an average of 9,163,961 gallons per 24 hours—an increase of 477,692 gallons as compared with the corresponding period of last year; the quantity supplied for domestic use averaging 23·59 gallons per head per 24 hours, or 0·41 gallon more than in the period named.

Blackburn Gas Strike Sequel.—The following echo of the recent municipal strike at Blackburn appeared in a local journal on Saturday: "Anticipations as to the chairmanship and vice-chairmanship of the Gas Committee being realized, Alderman Nuttall and Councillor Holgate respectively are established in these positions. The former Chairman (Councillor Hartley) retired from the Council; and if there was any expectation of his second-in-command (Councillor Shorrock) continuing to serve, it was dispelled by his declining to do so. Whatever revolutions may result from the expert's report on the gas undertaking, the Committee have obtained such a vote of confidence as is implied in re-election. With the exception of Mr. Higham for Mr. Hartley, its composition remains the same."

Gas-Cooking Stoves for a London Hospital.—At a meeting of the Metropolitan Asylums Board on Saturday, the Works Committee reported that they had obtained prices from three firms for the installation of additional gas-cooking plant at the Orchard Hospital, and, anticipating the approval of the Board, had accepted the estimates of Messrs. Moorwoods, Limited, of No. 143, Queen Victoria Street, E.C., for the supply and delivery of two large gas roasting stoves and two large potato steamers. The Board approved the action of the Committee. They also accepted the tenders of the Richmond Gas Stove and Meter Company, Limited, for the supply of 33 gas-stoves for the Grove Hospital, and of the Wandsworth and Wimbledon Gas Company, for the supply of 19 gas-meters and one gas-governor for the same institution.

Explosions in Electric Conduits at Leek.—Last Wednesday afternoon, several violent explosions occurred in Broad Street, Leek; portions of the pavement being lifted and the stone flags broken. They were caused by the ignition of a large accumulation of gas in the electric conduits. A lady was thrown down and rendered unconscious; but she only sustained a severe shock and bruises on the face. There was a somewhat similar accident in the street about twelve months ago.

Preston Corporation Water-Works Accounts.—The annual report of the Preston Borough Elective Auditors (Messrs. R. E. Smalley and R. Hornby) shows that the total revenue of the water-works for the past year amounted to £37,857—an increase of £1535 over the previous year; while the total expenditure increased by £209. The balance to the debit of revenue has been reduced to £2437. Aid from the rates was given to the extent of £1700. The adverse balance at March 31 last on revenue account amounted to £23,569.

The Increased Price of Gas in Bristol Out-Districts.—At the meeting of the Mangotsfield Parochial Committee last Wednesday, the Assistant Clerk (Mr. E. Mayell Williams) read a letter which he said had been sent to the Board of Trade on behalf of the Warmley Rural District Council, on the subject of the increased price of 2d. per 1000 cubic feet charged for gas by the Bristol Gas Company in the six parishes constituting the Warmley Out-Relief Union and in other outlying parishes. It was stated therein that the Council felt that they and the Councils representing the other parishes concerned had been treated by the Company in a most arbitrary manner; and as the Company refused to give any explanation, they desired to bring the matter to the notice of the Board of Trade.

Wath-upon-Dearne Water-Works Extensions.—According to an article in a recent issue of the "Mexbro' and Swinton Times," the extension of the water-works of the Wath-upon-Dearne Urban District Council, which is being carried out under the supervision of their Surveyor and Water-Works Engineer (Mr. J. H. Drew), is approaching completion. Owing to the inadequacy of the existing works and the insufficient supply to the town, Mr. Drew advised his Council in 1912 to undertake the construction of a new borehole, receiving and service reservoirs, pumping plant and station, new mains, and additional filters; and in June last year an inquiry in respect of a loan of £11,963, was held by one of the Inspectors of the Local Government Board. The Council will now be in the position of possessing an undertaking which will provide an abundant supply of water for the requirements of the existing, and also for a considerably increased, population.

GAS COMPANIES IN THE STOCK EXCHANGE.

The event of the week—dwarfing all other financial topics and considerations—was the triumphant success of the gigantic 350 million War Loan. The exact total applied for and other details have yet to be made public; but sufficient is known to make it clear that it was a genuine "people's loan." Holders of Consols may not like the prospect of their security suffering some cold eclipse, but—as the French saying goes—"Every medal has its reverse." Not much ground apparently was gained in the advance towards a re-opening of the Stock Exchange. It would be more correct, perhaps, to say "resumption of business" rather than "re-opening," for undoubtedly a very strong feeling is existent and is intensifying (especially on rainy days) that members might at least be allowed the shelter of their building within which to transact such limited business as they may, and not be driven to the cold street and muddy gutter. Despite the chilly influences, the open market was cheerful. Official information as to the progress of hostilities was satisfactory, and prices generally advanced in firmness. Gas issues were not in evidence; but the price of Primitiva ordinary for this week's settlement was fixed at 5⅛. The Croydon Gas Company opened tenders totalling £27,720 for an issue of £10,000 of 5 per cent. maximum stock. The average price obtained was £102 2s. per £100; the return for money being an imponderable fraction less than £4 18s. per cent. The Money Market continued in a condition of extreme ease; but discount was somewhat firmer.

Bank rate (fixed Aug. 8), 5 per cent.; last year, 5 per cent.

OFFICIAL QUOTATIONS AT THE CLOSE OF THE STOCK EXCHANGE ON JULY 30.

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
1,551,868	Stk.	April 8	2½	Alliance & Dublin Ord.	59–64	..	3 18 2
374,000	,,	July 10	4	Do. 4 p.c. Deb.	76–79	..	5 1 3
280,000	5	April 29	7½	Bombay, Ltd.	5⅛–6⅜	..	5 17 8
50,000	10	Feb. 26	16	Bourne-mouth Gas and Water — 10 p.c.	29–30	..	5 6 8
878,480	10	,,	7	Bourne-mouth Gas and Water — B 7 p.c.	15–15½	..	4 10 4
95,000	10	,,	6	Bourne-mouth Gas and Water — Pref. 6 p.c.	13½–14	..	4 5 9
880,000	Stk.	Feb. 26	14	Brentford Consolidated	261–266	..	5 5 3
830,000	,,	,,	11	Do. New	204–209	..	5 5 8
50,000	,,	,,	5	Do. 5 p.c. Pref.	109–111	..	4 10 1
206,250	,,	June 11	4	Do. 4 p.c. Deb.	91–93	..	4 6 0
217,380	Stk.	Feb. 26	11	Brighton & Hove Orig.	208–213	..	5 3 4
244,200	,,	,,	8	Do. A Ord. Stk.	154–159	..	5 0 8
530,000	20	Mar. 26	12½	British	44–45	..	5 11 1
120,000	Stk.	June 26	4	Do. 4 p.c. Deb. Stk.	88–90	..	4 8 11
245,771	Stk.	June 26	4	Buenos Ayres 4 p.c. Deb.	85–87	..	4 12 0
100,000	10	—	—	Cape Town & Dis., Ltd.	1½–2⅜	..	—
100,000	10	—	—	Do. 4½ p.c. Pref.	4–6	..	—
100,000	Stk.	June 26	4½	Do. 4½ p.c. Deb. Stk.	70–75	..	6 0 0
157,150	Stk.	Feb. 26	5	Chester 5 p.c. Ord.	103–110	..	4 10 11
1,513,280	Stk.	Feb. 12	5/9/4	Commercial 4 p.c. Stk.	106–108	..	5 1 2
560,000	,,	,,	5½	Do. 3½ p.c. do.	103–105	..	5 1 6
475,000	,,	June 11	3	Do. 3 p.c. Deb. Stk.	69½–71½	..	4 3 11
800 000	Stk.	,,	4	Continental Union, Ltd.	76–79	..	5 1 3
200 000	,,	,,	7	Do. 7 p.c. Pref.	115–118	..	5 18 8
412,270	Stk.	—	6	Derby Con. Stk.	123–125	..	4 16 0
55,000	,,	—	4	Do. Deb. Stk.	102–104	..	3 16 11
1,002,180	10	July 29	10	European, Ltd.	17½–18*	..	5 11 1
16,362,910	Stk.	Feb. 12	4/17/4	Gas — 4 p.c. Ord.	98–102	..	4 15 6
2,600,000	,,	,,	3½	Light and — 3½ p.c. max.	76–79	..	4 8 7
4,062,235	,,	,,	4	Light and — 4 p.c. Con. Pref.	96–99	..	4 0 10
4,674,850	,,	June 11	3	Coke — 3 p.c. Con. Deb.	72½–74½	..	4 0 6
258,740	Stk.	Mar. 12	5	Hastings & St. L. 3½ p.c.	87–89	..	5 12 4
70,000	10	April 29	11	Hongkong & China, Ltd.	16⅛–16⅜	..	6 11 4
131,000	Stk.	Mar. 12	7⅞†	Ilford A and C	151–154	..	5 2 4
65,790	,,	,,	6⅛†	Do. B	115–118	..	5 8 0
66,500	,,	June 26	4	Do. 4 p.c. Deb.	92–94	..	4 5 1
4,940,000	Stk.	May 14	9	Imperial Continental	150–160	..	5 12 6
1,235,000	Stk.	Feb. 12	3½	Do. 3½ p.c. Deb. Red.	84–86	..	4 1 5
200,242	Stk.	Mar. 12	6½	Lea Bridge Ord. 5 p.c.	119–121	..	5 7 5
561,000	Stk.	Feb. 26	10	Liverpool United A	211–213	..	4 13 11
718,100	,,	,,	7	Do. B	146–148	..	4 14 7
806,983	,,	June 26	4	Do. Deb. Stk.	97–99	..	4 0 10

Issue.	Share.	When ex-Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p.c.				£ s. d.
75,000	5	June 11	6	Malta & Mediterranean	4⅛–4⅜	..	6 9 9
250,000	100	April 1	4½	Met. of Melbourne — 4½ p.c. Deb.	99–101	..	4 9 1
541,920	20	May 28	4	Monte Video, Ltd.	11⅛–12	..	6 13 4
1,775,892	Stk.	July 29	4½	Newc'tle&G'tesh'd Con.	98⅝–99½	..	4 10 6
529,705	Stk.	June 26	3½	Do. 3½ p.c. Deb.	£2–83	..	4 4 10
55,940	10	Feb. 26	7/14.0	North Middlesex 7 p.c.	14–15	..	5 2 8
300,000	Stk.	May 14	8	Oriental, Ltd.	117–122	..	6 11 2
60000	5	Mar. 26	10	Ottoman, Ltd.	7¼–7⅜	..	6 9 0
60,000	50	Feb. 26	13	Portsea, Island B	128–131	..	4 19 3
100,000	50	..	12	Do. C	118–121	..	4 19 2
249,980	5	April 29	8	Primitiva Ord.	5⅛–6	..	6 13 4
499,960	5	June 26	5	,, 5 p.c. Pref.	4⅜–5	..	5 0 0
521,600	100	June 2	4	,, 4 p.c. Deb.	91–93	..	4 6 0
346,198	Stk.	June 26	4	River Plate 4 p.c. Deb.	85–87	..	4 12 0
150,000	10	May 14	6	San Paulo — 6 p.c. Pref.	10½–11	..	5 9 1
125,000	50	July 1	5	San Paulo — 5 p.c. Deb.	47–49	..	5 2 0
135,000	Stk.	Mar. 12	10	Sheffield A	223–224	..	4 9 3
209,984	,,	,,	10	Do. B	222–224	..	4 9 3
523,500	,,	,,	10	Do. C	230–232	..	4 10 1
90,000	10	May 28	9	South African	10½–11½	..	7 16 6
6,429,895	Stk.	Feb. 12	5/9/4	South Met., 4 p.c. Ord.	111–113	..	4 16 8
1,995,445	,,	July 10	8	Do. 3 p.c. Deb.	72½–74½	..	4 0 6
209,820	Stk.	Feb. 26	8½	South Shields Con. Stk.	157–159	..	5 6 11
952,795	Stk.	Feb. 26	6	S'th Suburb'n Ord. 5 p.c.	114–116	..	5 3 5
60,000	,,	,,	5	Do. 5 p.c. Pref.	110–112	..	4 9 3
187,058	,,	June 26	5	Do. 5 p.c. Deb. Stk.	116–118	..	4 4 9
629,740	Stk.	May 14	5	Southampton Ord.	99–102	..	4 18 0
120,000	Stk.	Feb. 12	7½†	Tottenham District — A 5 p.c.	135–138	..	5 8 8
742,275	,,	,,	6†	Tottenham District — B 3½ p.c.	115–117	..	5 2 7
181,255	,,	June 26	4	Tottenham District — 4 p.c. Deb.	87–89	..	4 9 11
182,380	10	Dec. 30	5	Tuscan, Ltd.	5–6	..	8 6 8
149,900	10	July 1	5	Do. 5 p.c. Deb. Red.	98–95	..	5 5 3
236,476	Stk.	Mar. 12	5	Tynemouth, 5 p.c. max.	108½–109½	..	4 11 4
80,000	Stk.	Feb. 26	8⅜	Wandsworth, Wimbledon, and Epsom— Wandsworth A 5 p.c.	151–156	..	5 7 4
255,636	,,	,,	6⅞	,, B 3½ p.c.	129–134	..	5 2 7
108,075	,,	,,	5/17/8	,, C 3½ p.c.	110–115	..	5 2 0
359,000	,,	,,	6⅜	Wimbledon 5 p.c.	117–122	..	5 0 5
98,000	,,	,,	6⅜	Epsom 5 p.c.	121–126	..	5 5 2
88,416	,,	June 26	3	3 p.c. Deb. Stk.	66–69	..	4 6 11

Prices marked * are "Ex Div." † Next Dividend will be at this rate.

Messrs. W. J. Jenkins and Co., Limited, have opened offices in London, at No. 15, Victoria Street, S.W.

The Bryan Donkin Company, Limited, have changed their London address from Parliament Mansions to Millbank House, Wood Street, Westminster.

Among the new joint-stock companies recently registered are the British Thorium Company, with a capital of £10,000, in £1 shares; and the Steam, Gas, and Oil Reversible Rotary Engine Company, with a capital of £6000, in £1 shares.

At a recent meeting of the Gas Committee of the Biddulph Urban District Council, it was decided to abandon the contract for a reinforced concrete tank for the gasholder, owing to the difficulty experienced in obtaining a proper foundation, and to substitute for it a steel tank; and the tenders of Messrs. R. Dempster and Sons, Limited, for the supply of the steel tank, and of Mr. Thomas Godwin, of Hanley, for the preparation of the site for the foundation, were accepted.

The Board of the Continental Union Gas Company, Limited, have resolved to pay, on the 4th prox., a final dividend of 2 per cent. on the ordinary stock, together with the half-yearly dividend of 3½ per cent, on the preference stock, in both cases less income-tax—making 4 and 7 per cent. respectively for the year.

As we are now again in what may be called the "Illustrated Lecture" season, it is opportune to point out that the James Keith and Blackman Company, Limited, of Farringdon Avenue, E.C., are always pleased to loan to any responsible person for lecturing purposes lantern-slides relating to their lighting specialities.

Mr. George Dickson, the Borough Treasurer of Wigan, has issued his annual statement of the Municipal accounts, covering the twelve months ended March 31 last. The summary of the financial position of the gas undertaking showed total liabilities amounting to £307,052, against total assets of £506,876. There is, therefore, an excess over liabilities of nearly £200,000.

WANTED, FOR SALE, CONTRACTS, &c., ADVERTISEMENTS IN THIS WEEK'S "JOURNAL."

Appointments, &c., Vacant.

RESIDENT ENGINEER. Bradford Water Works. Applications by Dec. 15.
CHEMIST. No. 5958.
DRAUGHTSMAN. R. & J. Dempster, Limited, Manchester.
RENTAL CLERK. Exmouth Gas Company.
GAS-FITTERS. Leicester Gas Department.
GAS-FITTERS. Birkenhead Gas-Works.

Gas-Works Wanted.

Particulars to "PRINCIPAL," Scripps's Advertising Offices, 13, South Molton Street.

Sales of Stocks and Shares.

KINGSTON GAS COMPANY. Sun Hotel, Kingston. Dec. 10.
READING GAS COMPANY. By Tender. Dec. 9.
SHREWSBURY GAS LIGHT COMPANY (Mortgage Bonds).

TENDERS FOR

Carbonizing Plant.
GOOLE URBAN DISTRICT COUNCIL. Tenders by Dec. 16.

Exhauster.
SALFORD GAS DEPARTMENT. Tenders by Dec. 10.

Fire-Clay Goods.
NOTTINGHAM GAS DEPARTMENT. Tenders by Dec. 15.

General Stores (Tools and Implements, Lead and Lead Pipe, Iron and Steel, Brass Goods, Lime, Paints, Oils, &c., &c.).
NOTTINGHAM GAS DEPARTMENT. Tenders by Dec. 15.

Lighting Goods for Street Lamps, &c.
CALCUTTA CORPORATION. Tenders by Feb. 15.

Meters, &c.
NOTTINGHAM GAS DEPARTMENT. Tenders by Dec. 15

Pipes, &c.
NOTTINGHAM GAS DEPARTMENT. Tenders by Dec. 15.

Sulphuric Acid.
SALFORD GAS DEPARTMENT.

Tar.
BIRMINGHAM PUBLIC WORKS DEPARTMENT. Tenders by Dec. 15.
SHOTLEY BRIDGE AND CONSETT GAS COMPANY. Tenders by Dec. 9.

NOTICES TO CORRESPONDENTS, ADVERTISERS, AND SUBSCRIBERS.

No notice can be taken of anonymous communications. Whatever is intended for insertion in the "JOURNAL" must be authenticated by the name and address of the writer; not necessarily for publication, but as a proof of good faith.

COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office NOT LATER than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or stoppages of, PERMANENT ADVERTISEMENTS should be received by the FIRST POST on SATURDAY.

Wanted, For Sale, and Tender Advertisements, Six Lines and under, 3s.; each additional Line, 6d.

TERMS OF SUBSCRIPTION to the "JOURNAL."

United Kingdom: One Year, 21s.; Half Year, 10s. 6d.; Quarter, 6s. 6d.
Payable in advance. If credit is taken, the charge is 25s. a year.

Abroad (in the Postal Union): £1 7s. 6d., payable in advance.

All Communications, Remittances, &c., to be addressed to WALTER KING, 11, BOLT COURT, FLEET STREET, LONDON, E.C.

Telegrams: "GASKING, FLEET LONDON." Telephone: Holborn 6857.

OXIDE OF IRON.

O'NEILL'S OXIDE
For GAS PURIFICATION.
LARGEST SALE OF ANY OXIDE.

SPENT OXIDE PURCHASED IN ANY DISTRICT.

GAS PURIFICATION & CHEMICAL CO., LD.,
PALMERSTON HOUSE,
OLD BROAD STREET, LONDON, E.C.

WINKELMANN'S
"VOLCANIC" FIRE CEMENT.
Resists 4500° Fahr. Best for GAS-WORKS.
ANDREW STEPHENSON, 171, Palmerston House, Old Broad Street, London, E.C. "Volcanism, London."

D. ANDERSON AND COMPANY,
GAS LIGHTING ENGINEERS AND CONTRACTORS.
18 & 20, FARRINGDON ROAD, LONDON, E.C.
Telegrams: "DAYLIGHT LONDON." Telephone: 2886 HOLBORN.

AMMONIACAL Liquor Wanted.
CHANCE AND HUNT, LTD., Chemical Manufacturers, OLDBURY, WORCS.
Telegrams: "CHEMICALS."

JOHN RILEY & SONS, Limited, Chemical Manufacturers, Hapton, near Accrington, are MAKERS of Special SULPHURIC ACID, for Sulphate of Ammonia Making. Highest percentage of Sulphate of Ammonia obtained from the use of this Vitriol, which has now been used for upwards of 50 years. References given to Gas Companies.

J. & J. BRADDOCK (Branch of Meters Limited), Globe Meter Works, OLDHAM, and 45 & 47, Westminster Bridge Road, London, S.E.
WET AND DRY GAS-METERS, PREPAYMENT METERS, STATION METERS AND GOVERNORS.
REPAIRS RECEIVE PROMPT ATTENTION.
Telephones 815 Oldham, and 2412 Hop, London.
Telegrams—
"BRADDOCK, OLDHAM," and "METRIQUE, LONDON."

TAR WANTED.
THOMAS HORROCKS & SONS, LTD.,
Albert Chemical Works,
NORTON STREET, MILES PLATTING, MANCHESTER.
Pitch, Creosote, Brick and Fuel Oils, Benzol, Solvent Naphtha, Carbolic, Lysol, Sulphate of Ammonia.

EDWARD COCKEY & SONS, LTD.,
Supply
COMPLETE CARBONIZING PLANTS,
WASHER SCRUBBERS,
PURIFIERS,
SPIRAL OR STANDARD GUIDED GAS-HOLDERS.
Prices and Designs on Application to
THE IRONWORKS, FROME, or
LONDON OFFICE: 39, VICTORIA ST., WESTMINSTER, S.W.

SULPHURIC ACID — Specially prepared for Sulphate of AMMONIA and BENZOL Recovery Plants. JOHN NICHOLSON & SONS, LTD., Hunslet Chemical Works, LEEDS. Tele.: "NICHOLSON, Leeds." Telephone: (Two Lines) Nos. 2420 and 2421.

TAR WANTED.
THE Burnden Tar Company (Bolton), Ld.
HULTON CHEMICAL WORKS, BOLTON.

OXIDE OF IRON.
We are in a position to Supply Oxide of Iron promptly, and invite Enquiries.
SPENT OXIDE WANTED.
BALE & CHURCH, LTD.
5, CROOKED LANE, LONDON, E.C.

"TORTO" FIRE CEMENT.
BALE & CHURCH, LTD.
5, CROOKED LANE, LONDON, E.C.

"KLEENOFF," THE COOKER CLEANSER
Tins for sale to Consumers.
In Bulk for Works Use.
BALE & CHURCH, LTD.
5, CROOKED LANE, LONDON, E.C.

PATENTS AND TRADE MARKS
PUBLICATIONS: "MERCHANDISE MARKS ACT, and Decisions thereunder," 1s.; "TRADE SECRETS v. PATENTS," 6d.; "DOCTRINE of EQUIVALENTS, Mechanical and Chemical," 6d.; "SUBJECT-MATTER of PATENTS," 6d.
MEWBURN, ELLIS, & PRYOR, Chartered Patent Agents, 70 & 72, Chancery Lane, London, W.C. Telegrams: "Patent London." Telephone: No. 248 Holborn.

"GAZINE" (Registered in England and Abroad). A radical Solvent and Preventative of Naphthalene Deposits, and for the Automatic Cleaning of Mains and Services.
It is also used for the Enrichment of Gas.
Manufactured and Supplied by C. BOURNE, West Moor Chemical Works, KILLINGWORTH, or through his Agents, F. J. NICOL & Co., Pilgrim House, NEWCASTLE-ON-TYNE.
Telegrams: "DORIC," Newcastle-on-Tyne. National Telephone No. 2497.

ROBERT DEMPSTER & SONS, Ltd., Contractors for Complete CARBONIZING PLANTS and every Description of GAS APPARATUS, ELEVATING, CONVEYING, and TELPHERAGE PLANTS, also STOKING MACHINERY, Rose Mount Ironworks, Elland.

TAR WANTED.

JOSEPH A. HUTCHISON, LIMITED, Highbridge Wharf, SOMERSET.

SULPHURIC ACID.

SPECIALLY prepared for Sulphate of AMMONIA Makers by

CHANCE AND HUNT, LIMITED.

Works: Oldbury, Wednesbury, and Stafford.

Address Correspondence and Inquiries to Oldbury, Worcs.

Telegrams: "Chemicals, Oldbury."

HUTCHINSON BROTHERS, Ltd., Falcon Works, Barnsley.

Manufacturers of

GAS METERS (Ordinary and Prepayment), "FALCON" INVERTED LAMPS and SQUARE LANTERNS for Street Lighting, INVERTED BURNERS and CONVERSION SETS for Street Lamps.

SULPHURIC ACID.

SPECIALLY prepared for the Manu-facture of SULPHATE OF AMMONIA.

SPENCER CHAPMAN & MESSEL, LTD., with which is amalgamated Wm. Pearce & Sons, Ltd., 36, Mark Lane, London, E.C. Works: Silvertown.

Telegrams: "Hydrochloric, Fen. London."

Telephone: 1588 Avenue (3 lines).

SPENCER'S PATENT HURDLE GRIDS.

THE very best Patent Grids for Holding Oxide Lightly.

See Illustrated Advertisement, Oct. 20, p. 158.

ENQUIRIES SOLICITED.

FOR Gas-Works Plant of Every De-scription; also SULPHATE OF AMMONIA and SULPHUR RECOVERY PLANTS.

C. & W. WALKER, LIMITED, DONNINGTON, NEWPORT, SALOP.

SULPHATE OF AMMONIA SATURATORS and all LEAD and TIMBER WORK in Connection with Sulphate Plants.

We Guarantee promptness with efficiency for Repairs.

Joseph Taylor and Co., Central Plumbing Works, Bolton.

Telegrams: "Saturators Bolton." Telephone 0848.

GAS PLANT for Sale—We can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. Compare Prices and Particulars before ordering elsewhere.

Firth Blakeley, Sons, and Company, Limited, Church Fenton, near Leeds.

HYDRATED OXIDE OF IRON.

PREPARED from Pure Iron.

Twice as rich as Bog Ore.
Gives no back Pressure.
The Cheapest in the Market.

Read Holliday and Sons, Ltd., Huddersfield.

J. E. C. LORD, Ship Canal Tar-Works, Weaste, Manchester. Pitch, Creosote, Benzols, Toluol, Naphtha, Pyridine, all kinds of Cresylic Acid, Carbolic Acid, Sulphate of Ammonia, &c.

TO GAS AND WATER OFFICIALS.

BEFORE Purchasing your 1914 Cycle, kindly send post-card for our CATALOGUE. Cash or gradual Payments. Speciality, Slot-Meter Copper Collector. Melrose Cycle Co., Coventry.

GAS-WORKS requiring Extensions should Communicate with FIRTH BLAKELEY, SONS, AND CO., LIMITED, Dewsbury, who make a Speciality of Catering for the Smaller Gas Concerns. Prices Reasonable; quality and results, the *best*. Satisfaction Guaranteed.

INCANDESCENT MANTLES

Made in Sweden, with British Consular Certificate of Origin. Best Quality for Gas and Oil. Single, Double, and Hill Weave, all Sizes and Shapes. Prompt Delivery.

Apply for Quotations. Send your own Samples. Inspection of Works invited.

Our Capital is Entirely Swedish.

AKTIEBOLAGET KEROS, Mantle Manufacturer, SÖDERTELJE, SWEDEN (Established 1899.)

CHEMIST.

ENGINEER wishes to Consult from time to time QUALIFIED CHEMIST with Practical Gas-Works Experience.

State Department of Special Knowledge to No. 5958, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

BRADFORD WATER-WORKS.

NIDD VALLEY SCHEME.

CONTRACT No. 15.

WANTED, a Resident Engineer to Supervise the Construction of 36-inch Diameter Cast-Iron and Steel Mains, Chambers, &c., in connection with the second line of the Nidd Valley Works.

Applications, stating Experience, Age, Three recent Testimonials, and Salary required, to be sent to Mr. James Watson, M.Inst.C.E., Water-Works Engineer, Town Hall, Bradford, on or before the 15th of December, 1914.

Frederick Stevens, Town Clerk.

Town Hall, Bradford, Nov. 24, 1914.

WANTED—First-Class Experienced DRAUGHTSMAN for Gas Plant, Constructional and Coke-Oven Work. Good Salary and Permanent Position for Suitable Man.

Apply to R. & J. Dempster, Limited, Gas Plant Works, Manchester.

GAS-FITTERS.

TEMPORARY Gas-Fitters Wanted. Wages, 9d. per Hour for Qualified Men.

Only Married Men out of Employment need Apply, Gas Offices, Leicester.

GAS-FITTERS.

REQUIRED at once, about six Good Men, used to fixing Gas-Fires. Must be good tradesmen. Wages 37s. 6d. (Thirty-Seven Shillings and Sixpence) for 53 Hours. Permanent Employment.

Apply, stating Age, Experience, and References, to Gas Engineer, Gas-Works, Birkenhead.

RENTAL Clerk Wanted. Apply, stating Age and Salary required, to the Manager, Gas-Works, Exmouth.

ADVERTISER is prepared to Pay a Commission to anyone Introducing a SMALL GAS-WORKS that can be PURCHASED for Cash, where there is Scope for Development.

Particulars in Confidence, or write for interview to "Principal," Scripps's Advertising Offices, 13, South Molton Street, W.

COUNTY BOROUGH OF SALFORD.

(Gas Department.)

TENDERS are invited for the Supply of about 1800 Tons of SULPHURIC ACID.

Full Particulars may be obtained on Application to Mr. William W. Woodward, Engineer, Gas Offices, Salford.

COUNTY BOROUGH OF SALFORD.

(Gas Department.)

THE Gas Committee invite Tenders for the Supply and Erection of Four ROTARY EXHAUSTERS at their Liverpool Street Works.

The Drawings may be seen, and Copies of the Specification and Form of Tender obtained, on application to Mr. William W. Woodward, Engineer, Gas Offices, Bloom Street, Salford.

Sealed Tenders, endorsed "Tender for Exhausters," to be Delivered to me not later than 3 p.m. on Thursday, the 10th of December, 1914

CITY OF BIRMINGHAM.

COAL-GAS TAR.

THE Public Works Committee are prepared to receive TENDERS for the Supply of about 1500 Tons of COAL-GAS TAR, to be Delivered during the coming Spring and Summer to various Corporation depôts within the City, by Boat, Rail, or Road, as circumstances permit.

Tenders may be given for the whole quantity of 1500 Tons, or any less quantity.

Specification and Form of Tender may be obtained at the Office of the undersigned, where Tenders, endorsed "Tenders for Tar," are to be Delivered by Tuesday, the 15th of December, 1914.

The Corporation do not bind themselves to accept the lowest or any Tender.

Henry E. Stilgoe, M.Inst.C.E., City Engineer and Surveyor.

The Council House, Birmingham, Nov. 25, 1914.

CORPORATION OF NOTTINGHAM.

(Gas Department.)

TENDERS FOR THE SUPPLY OF GOODS AND MATERIALS.

THE Gas Committee are prepared to receive TENDERS for the Supply of the Whole or a Portion of their Requirements of the following GOODS and MATERIALS for Delivery during the ensuing Year, Carriage Paid, at their various Gas Stations, Chemical Works, or Stores, or at any Railway Station within the Nottingham Gas Supply District:—

(*b*) PIG LEAD, LEAD and COMPO PIPE, WHITE, RED, and CHEMICAL SHEET LEAD.
(*c*) WROUGHT IRON and STEEL.
(*d*) RETORTS and FIRE MATERIALS.
(*e*) METERS and REPAIRS.
(*f*) WROUGHT-IRON TUBES and FITTINGS.
(*g*) BRASS COCKS and MALLEABLE IRON LEVERS.
(*k*) LIME for CHEMICAL WORKS PURPOSES.
(*l*) PAINTS.
(*m*) OILS.
(*n*) ROPE YARN.
(*o*) TALLOW, &c.
(*p*) COTTON WASTE.
(*q*) COKE FORKS, SHOVELS, BUCKETS, FILES, &c.
(*r*) METER BOXES, PLATFORMS and SHELVES.
(*t*) PLUMBING.
(*u*) TOOLS for DISTRIBUTION DEPARTMENT.
(*v*) WINDOW CLEANING.

Specifications and Forms of Tender may be obtained, and Samples seen, on Application to the Engineer and General Manager at the Gas Offices, George Street, Nottingham.

Tenders, to be addressed to me and to be Delivered at the Guildhall, Nottingham, not later than Tuesday, the 15th of December next.

The Gas Committee do not bind themselves to accept the lowest or any Tender.

W. J. Board, Town Clerk.

Guildhall, Nottingham, Nov. 28, 1914.

CORPORATION OF CALCUTTA.

NOTICE.

TENDERS are invited for the Supply of LIGHTING STORES for Public Street Lamps and Municipal Markets for Twelve Months from the 1st of April, 1915.

Complete Specification and Descriptive Lists of Stores required, together with Tender Form, may be obtained from the Superintendent of Stores of the Corporation, 34, Wellington Street, Calcutta.

The following is a brief summary of the principal Articles required:—

(*a*) Inverted and Upright Incandescent GAS-MANTLES for Street Lighting.
(*b*) INVERTED INCANDESCENT GAS-BURNERS complete.
(*c*) GLASS CYLINDERS for Inverted Burners.
(*d*) GLASS PROTECTORS for Upright Burners.
(*e*) GLASS PANES for Street Lamps.
(*f*) BRASS ADAPTATION FITTINGS and UNIONS.

Samples are required where stated in the List, and these must be addressed to the Lighting Superintendent to the Corporation, Fenwick Bazar Street, Calcutta, carriage paid.

Tenders must include Delivery Free of all Charges at the Corporation Stores, Calcutta, including Duty and Insurance against Breakages. War Risk Insurance and Extra Freight Charges (if any) to be separately stated.

The Corporation do not bind themselves to accept the lowest or any Tender, and will be at liberty to accept the whole or part of a Tender.

Tenderers may quote for any or all of the items mentioned in the List.

Payment will be made when Delivery is accepted.

Tenders must be addressed to, and will be received by, the Vice-Chairman of the Corporation up to 2 p.m. on Monday, Feb. 15, 1915, when they will be opened in the presence of such tenderers as may be present.

Each Tender must be enclosed in Sealed Cover, and superscribed "Tender for Lighting Stores."

No Tender will be considered unless accompanied by a remittance to the extent of 2½ per cent. on the total value of such Tender.

Tenderers must abide by the Rules in regard to Tenders in vogue in the Corporation, and are required to submit Tenders on the Corporation Forms above referred to.

C. C. Chatterjee, Secretary to the Corporation.

Municipal Office, Oct. 29, 1914.

SHOTLEY BRIDGE AND CONSETT DISTRICT GAS COMPANY.

TENDERS FOR TAR.

THE Directors of this Company invite TENDERS for the Purchase of the TAR to be produced at their Works during the Year 1915.

Approximate Quantity, 90,000 Gallons.

The Contractor to find his own Casks and to accept Delivery at Blackhill Station.

Tenders to be sent to the undersigned not later than Wednesday, Dec. 9, 1914.

M. Richley, Secretary.

Offices, Front Street, Shotley Bridge.

GOOLE URBAN DISTRICT COUNCIL.

THE above Council are prepared to receive TENDERS for the Erection of a COAL CARBONIZING PLANT capable of producing 600,000 cubic feet of gas per 24 hours.

Full Particulars and Specification may be obtained on Application to the Gas and Water Engineer, Mr. J. Fazakerley, Doyle Street, Goole.

Prices, Drawings, &c., to be Delivered to me not later than noon on Wednesday, Dec. 16, 1914.

The Council do not bind themselves to accept the lowest or any Tender.

Robert Tyson, Clerk to the Council.

Council Offices, Goole.